ENVIRONMENTAL ASSESSMENT OFFICE

COURSIER DAM DECOMMISSIONING PROJECT

ASSESSMENT REPORT

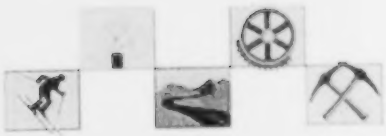
With Respect to:

Issuance of an Environmental Assessment Certificate Pursuant to the *Environmental Assessment Act*, S.B.C. 2002, c. 43

And

The Requirements of a Screening Report Pursuant to the *Canadian Environmental Assessment Act*, S.C.1992, c. 37

April 2003



BRITISH COLUMBIA

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Executive Summary

Coursier Dam is a 685 metre long earth fill dam located near the outlet of Coursier Lake in the Columbia-Shuswap Regional District approximately thirty kilometres due south of Revelstoke, British Columbia. The dam provides water storage for the Walter Hardman Generating Station located approximately 12 kilometres downstream as shown in Figure 1. The reservoir is normally filled between April and August by local run-off and then storage is gradually released primarily during the fall and winter to partially regulate inflows to the generating station. Constructed to a height of 12.3 metres in 1963 and raised to its current height of 19 metres in 1969, the dam raised Coursier Lake by 17.8 metres from an initial average lake level of Elevation (El.) 1266 metres to a maximum normal operating level of El. 1283.8 metres.

Coursier Dam has a history of dam safety incidents. There is inadequate filtering for the applied hydraulic gradients within the dam which means that internal erosion of the dam's soil by piping will eventually lead to the development of sinkholes on the upstream face and/or high water pressures in the downstream shell that can lead to progressive sloughing. Either of these results could cause subsidence of the crest of the dam sufficient to cause overtopping and sudden release of the reservoir. In September 1998, BC Hydro's Director of Dam Safety ordered the reservoir lowered to a maximum normal operating level of El. 1274 metres as a temporary measure to reduce dam safety concerns.

Since then, BC Hydro has reviewed several dam remediation options including reconstruction, partial decommissioning (lowered operating levels) and full decommissioning. The estimated cost of replacing the dam to meet modern standards is estimated at $12 million whereas the dam decommissioning would be $3 million.[1]

BC Hydro has concluded that dam decommissioning and abandonment of the water licences is the most efficient option in terms of cost and elimination of dam safety risk and would allow for restoration of large areas of habitat destroyed or degraded when the dam was originally constructed. On December 20, 2002, BC Hydro filed an application for an environmental assessment certificate (Application) under the *Environmental Assessment Act* S.B.C. 2002, c.43 (Act) to decommission the Coursier Dam. BC Hydro estimates that construction and revegetation work will take place over a two year period as follows:

- Excavation of a notch through the dam and construction of a restoration channel in 2003 to restore natural drainage functions between Coursier Lake and South Cranberry Creek and provide spawning and rearing habitat for fish. This work will include demolition of parts of the low level outlet, the spillway and decommissioning of the valve house;
- Revegetation of the restoration channel in fall 2003 to ensure stability over the winter; and
- Reclamation, stabilization and revegetation of other disturbed areas in summer 2004.

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[1] *Coursier Dam Decommissioning Project: Application to the British Columbia Environmental Assessment Office*, BC Hydro, December 2002, p.14.

The scope of the environmental assessment included the following on-site and off site components and activities:

Onsite:

- Drawdown of the Coursier Reservoir
- Excavation of a notch through the Coursier Dam
- Construction of a restoration channel in the notch
- Removal or decommissioning of the low level outlet and spillway
- Disposal of spoil materials
- Reclamation and revegetation of disturbed areas

Off-site:

- Upgrade of existing access roads
- Construction and decommissioning of temporary haul roads
- Quarry activities

Public Comments

Following an extensive pre-application consultation program conducted by BC Hydro, the Environmental Assessment Office established a thirty-six day public comment period on the Application from January 13 to February 17, 2003 during which one letter was received from the public. There are no significant public concerns. The EAO is satisfied that public comment received during the environmental assessment process has been properly considered.

Summary of Key Issues

Dam Safety

To address the risk of flooding from unseasonably high rainfall or snowmelt during excavation of the notch in the dam, BC Hydro's construction strategy will include an assessment of the risk of flooding. No excavations will begin until the spring flood period has passed. The Environmental Management Plan will include flood contingency planning measures and BC Hydro will have a construction emergency response plan to address an extreme storm event. Construction methods and resources will be sufficient to complete excavations and install the restoration channel within thirty-five days thereby providing flexibility to mitigate against weather and construction delays. BC Hydro will submit a dam safety issues management plan to the Dam Safety Unit of Land and Water British Columbia Inc. for review and approval prior to the start of the project.

Fish and Fish Habitat

Higher than normal numbers of rainbow trout may be entrained from Coursier Lake into South Cranberry Creek during reservoir drawdown and coffer dam construction. BC Hydro proposes to mitigate potential entrainment impacts through fish salvage and exclusion netting measures to be specified as part of the final Environmental Management Plan. After the dam is decommissioned, Coursier Lake will revert to its natural pre-dam area and elevation or approximately 72% of the volume of the current operational level of the reservoir. BC Hydro has committed to complete a Fish and Fish Habitat Mitigation and Compensation Plan and to implement the plan to achieve No Net Loss of the productive capacity of fish habitat for the South Cranberry Creek/Coursier Lake system relative to pre-dam conditions.

Water Quality

BC Hydro predicts that careful planning and execution of an erosion and sediment control plan will minimize the potential water quality effects such as elevated total suspended solids (TSS) and turbidity within Coursier Lake, First Creek and Lower South Cranberry Creek. BC Hydro will regularly monitor turbidity levels at designated sampling stations. Sedimentation and other effects on water and fish habitat will also be minimized during decommissioning by carrying out work in the dry (outlet channel restoration for example). Spill contingency planning will minimize the potential for water quality effects resulting from fuel spills and other accidents. All refuelling of equipment will be required to take place at least thirty metres away from watercourses.

Revegetation Program

Decommissioning the dam will restore approximately 147 hectares of terrestrial habitat previously flooded by the reservoir (82 hectares of forest, 65 hectares of marsh and scrubland). BC Hydro proposes to combine natural and artificial methods of regeneration to re-establish vegetation communities within the reservoir area similar to those existing prior to inundation and restore excavated and disturbed areas (access roads, passing lanes, staging areas, stockpile and spoil areas) to conform to the natural landscape. BC Hydro will be required to conduct vegetation surveys over a ten year period to monitor the effectiveness of the revegetation program and to implement additional measures where necessary.

1.0 Project Background

Coursier Dam is a 685 metre long earth fill dam located near the outlet of Coursier Lake in the Columbia-Shuswap Regional District approximately thirty kilometres due south of Revelstoke, British Columbia. The dam provides water storage for the Walter Hardman Generating Station (WHGS) located approximately 12 kilometres downstream as shown in Figure 1. The reservoir is normally filled between April and August by local run-off and then storage is gradually released primarily during the fall and winter to partially regulate inflows to the generating station. Constructed to a height of 12.3 metres in 1963 and raised to its current height of 19 metres in 1969, the dam raised Coursier Lake by 17.8 metres from an initial average lake level of El. 1266 metres to a maximum normal operating level of El. 1283.8 metres.

Coursier Dam has a history of dam safety incidents. There is inadequate filtering for the applied hydraulic gradients within the dam which means that internal erosion of the dam's soil by piping will eventually lead to the development of sinkholes on the upstream face and/or high water pressures in the downstream shell that can lead to progressive sloughing. Either of these results could cause subsidence of the crest of the dam sufficient to cause overtopping and sudden release of the reservoir. In September 1998, BC Hydro's Director of Dam Safety ordered the reservoir lowered to a maximum normal operating level of El. 1274 metres as a temporary measure to reduce dam safety concerns.

Since then, BC Hydro has reviewed several dam remediation options including reconstruction, partial decommissioning (lowered operating levels) and full decommissioning. The estimated cost of replacing the dam to meet modern standards is estimated at $12 million whereas the dam decommissioning would be $3 million.[2]

BC Hydro has concluded that dam decommissioning and abandonment of the water licences is the most efficient option in terms of cost, elimination of dam safety risk and restoration of the lake and valley to pre-dam conditions. Accordingly, on December 20, 2002 BC Hydro filed an application for an environmental assessment certificate (Application) under the *Environmental Assessment Act* S.B.C. 2002, c.43 (Act) to decommission the Coursier Dam.

2.0 Provincial and Federal Review of the Project

Basis for the Provincial Review

The dismantling of an existing dam associated with an existing hydroelectric power plant is a reviewable project under the Act if the dam is (or was) permitted under the *Water Act* to impound $\geq$ 10 million cubic metres of water. BC Hydro holds two conditional water licences for the Coursier Dam and each licence allows for the storage of 11,000 acre feet for a total impoundment capacity of just over 27 million cubic metres of water.

Basis for the Federal Review

A project is subject to the *Canadian Environmental Assessment Act* (CEAA) where a federal authority either: proposes a project; sells, leases, or otherwise transfers control or administration of land to enable a project to be carried out; contributes money or any other form of financial assistance to a project; or exercises in relation to the project a regulatory duty (such as issuing

[2] *Coursier Dam Decommissioning Project: Application to the British Columbia Environmental Assessment Office*, BC Hydro, December 2002, p.14.

a license, permit and approvals) that is included in the *Law List* regulation. For the decommissioning project, BC Hydro will require an authorization under section 32 and 35 of the federal *Fisheries Act* which is included in the Law List regulation. Fisheries and Oceans Canada (DFO) is the federal responsible authority for this screening level assessment under CEAA.

Cooperative Review Process

The Canada/British Columbia Agreement for Environmental Assessment Cooperation provides for coordinated environmental assessment processes to avoid uncertainty and duplication where a project is subject to the review under the Act and CEAA. For cooperative reviews, the CEAA assessment is conducted using the process established by the provincial Act and the results are documented in a common environmental assessment report.

With regard to requirements for a screening report under CEAA, in addition to this Assessment Report for the Coursier Dam Decommissioning Project, DFO will draw its CEAA conclusion in a separate and subsequent letter to the EAO. In that letter DFO will base its CEAA conclusion on relevant factors reported in this Assessment Report as well as other matters pertaining to federal decision-making.

3.0 Project Components and Scope of Assessment

Figure 2 shows the existing dam structures and location of the proposed excavation of the notch. The assessment of the Coursier Dam Decommissioning Project includes the following on-site and off-site components and activities:

Onsite:

- Drawdown of the Coursier Reservoir
- Excavation of a notch through the Coursier Dam
- Construction of a restoration channel in the notch
- Removal or decommissioning of the low level outlet and spillway
- Disposal of spoil materials
- Reclamation and revegetation of disturbed areas

Off-site:

- Upgrade of existing access roads
- Construction and decommissioning of temporary haul roads
- Quarry activities

To lower the reservoir, BC Hydro proposes to open the low level outlet fully in the spring to allow as much water as possible to pass downstream. Depending on weather conditions and rainfall, the reservoir would reach the required low level of El. 1266 metres between mid-August and mid-September. This provides only a short construction period until winter conditions limit construction activities.

While the reservoir is lowered, excavation of the downstream face of the dam will create a notch within which a restoration channel will be constructed to improve drainage functions between Coursier Lake and South Cranberry Creek and provide spawning and rearing habitat for fish. During channel construction, a portion of the upstream face of the dam will remain in place, creating a three metre wide plug to divert water through the low level outlet.

To remove the plug, a temporary cofferdam will be built upstream of the dam to isolate the work area while the remaining excavations and channel restoration are completed. Once the coffer dam is in place, pumps will be used to convey water to South Cranberry Creek for fish and fish habitat and to maintain the lake level at El. 1266 metres. The low level outlet will then be removed and the spillway demolished and buried.

Excavation of the notch will require removal and disposal of approximately 105,000 cubic metres of earth and rock. This material will be hauled by truck over a period of about five weeks to the two spoil disposal areas shown in Figure 3. BC Hydro proposes to combine natural and artificial methods of regeneration to re-establish vegetation communities within the reservoir area similar to those existing prior to inundation and restore excavated and disturbed areas (access roads, passing lanes, staging areas, stockpile and spoil areas) to conform to the natural landscape.

BC Hydro estimates that construction and revegetation work will take place over a two year period as follows:

- Excavation of a notch through the dam and establishment of the channel lining in late summer/fall 2003. This work will include demolition of parts of the low level outlet, the spillway and decommissioning of the valve house;
- Revegetation of the channel in fall 2003 to ensure stability over the winter; and
- Reclamation, stabilization and revegetation of other disturbed areas in summer 2004.

To meet requirements of the Act the assessment considered the potential of the project for impacts to:

- Fish and Fish Habitat
- Wildlife and Wildlife Habitat
- Water Quality
- Vegetation
- Dam Safety
- Heritage Values
- Social and Economic Values

and took into account practical means to prevent or reduce to an acceptable level any potential significant adverse effects.

The following additional factors were also considered by DFO towards reaching its CEAA conclusion on the likelihood of the project causing significant adverse environmental effects:

- Cumulative Environmental Effects
- Current Use of Land and Resources
- Accidents and Malfunctions
- Effects of Environment on Project

4.0 Consideration of Alternatives

BC Hydro's assessment of dam remediation options included a geotechnical evaluation to qualitatively determine dam safety risks, evaluation of operating or maintenance costs and evaluation of the potential effect on power generation at the WHGS. Twelve risk control options were initially assessed and the following three options, which provided least risk of dam failure, were then assessed in greater detail:

- Abandonment of the majority of reservoir storage;
- Complete rebuild of the entire dam; and
- Dam decommissioning.

Abandonment of the majority of reservoir storage was rejected because it would require continued operation of the dam and would have a higher annual operating cost than dam decommissioning. The risk of piping through the already damaged fill and foundation could not be entirely eliminated and in a flood event, the sudden flow could erode the dam and again cause a high risk of failure. Rebuilding the entire dam is considered ineffective from a business perspective since high capital costs (approximately $12 million) would never be recovered.

BC Hydro concluded that to decommission the dam and abandon the water licences was the most efficient option in terms of cost (approximately $3 million), reduced dam safety risk and environmental benefits.

5.0 Information Distribution and Consultation

On January 27, 2003, within the time limit set by the order issued under section 11 of the Act for the scope, procedures and methods for this project review, the Environmental Assessment Office (EAO) issued a written evaluation of the adequacy of BC Hydro's program of notification and consultation which took into account the information provided in Sections 6 and 7 of BC Hydro's Application, any additional information provided by BC Hydro and feedback from First Nation and agency representatives.

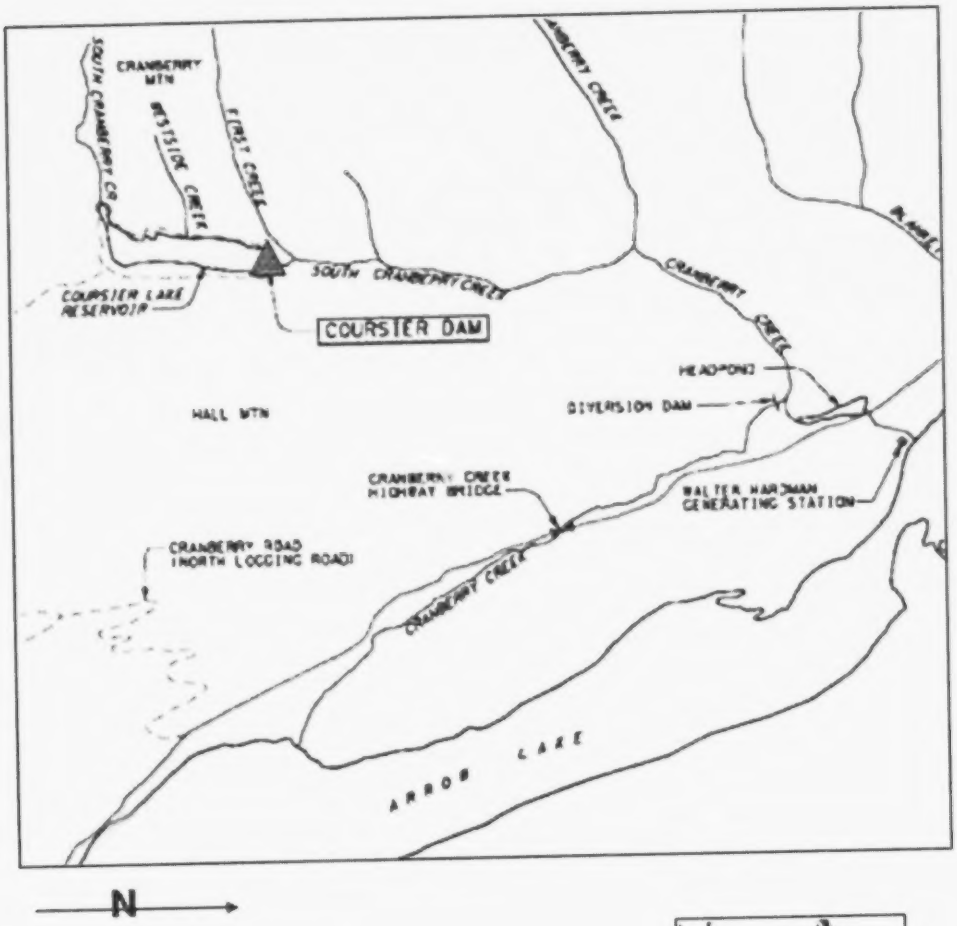
The EAO, after discussion with government agencies, concluded that the program of public notification and consultation completed and proposed by BC Hydro was adequate and that BC Hydro made considerable effort during the preparation of the Application to notify and consult with public stakeholders.

With respect to First Nations, the EAO requested BC Hydro to continue consultations with the ONA and the Shuswap Nation Tribal Council, include opportunity for input from First Nations on the revegetation plan and consider First Nation capacity issues.

5.1 Public Participation During the Environmental Assessment Review

The EAO established a thirty-six day public comment period on the Application from January 13 to February 17, 2003. BC Hydro advertized the environmental assessment review and dates of the public comment period in the *Revelstoke Times Review* and the *Revelstoke News*. The EAO placed notice of the environmental assessment review and public comment period on the Project Information Centre and posted a copy of the Application and concurrent permit applications on-line for public viewing.

FIGURE 1 – Project Location



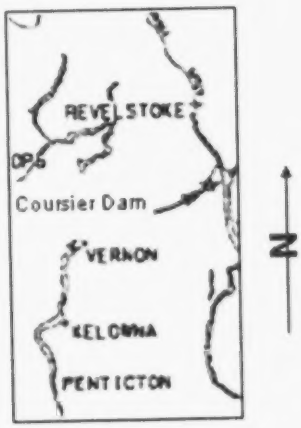


Figure 2 – Existing Dam Structures and Proposed Excavation

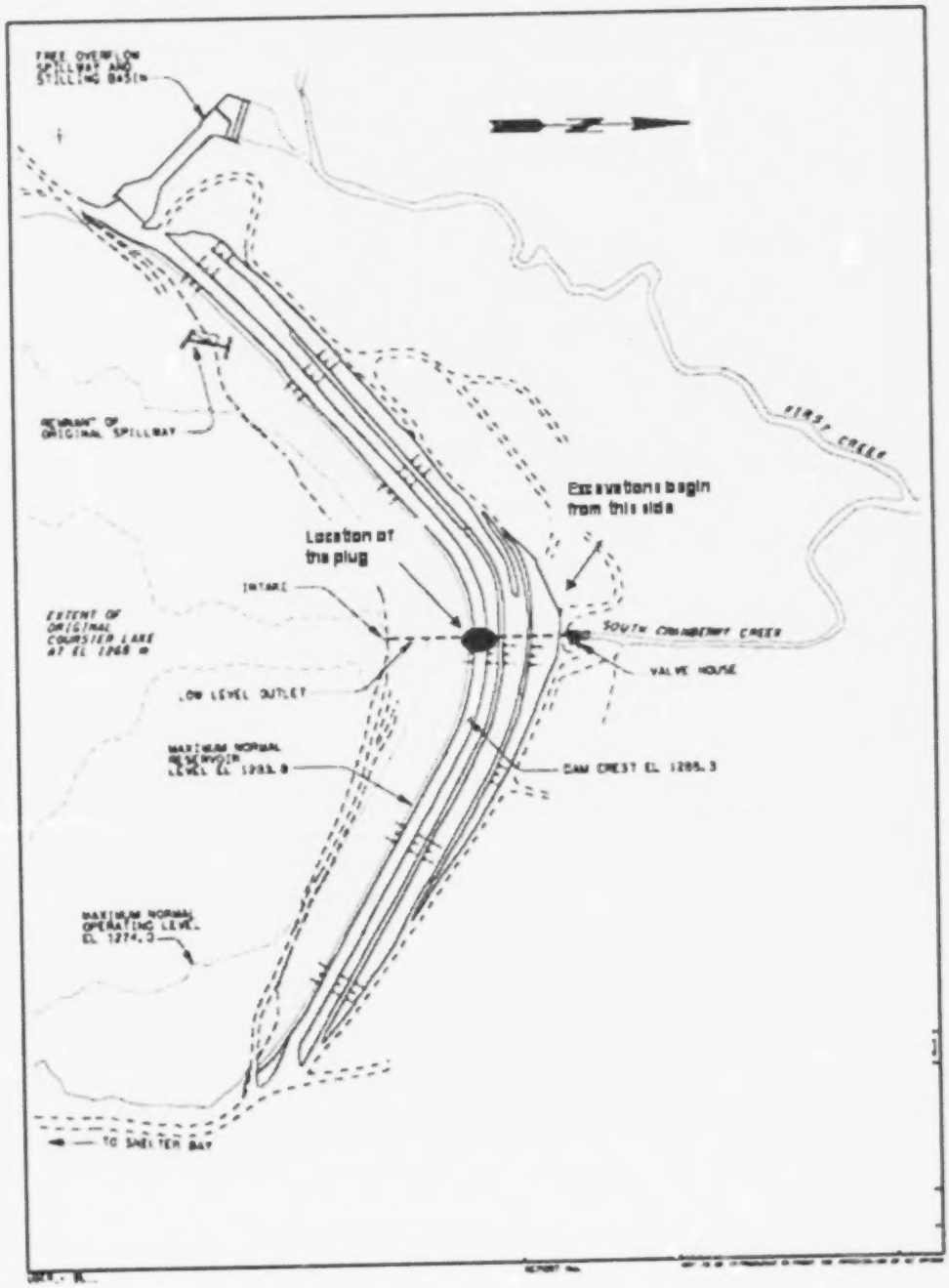
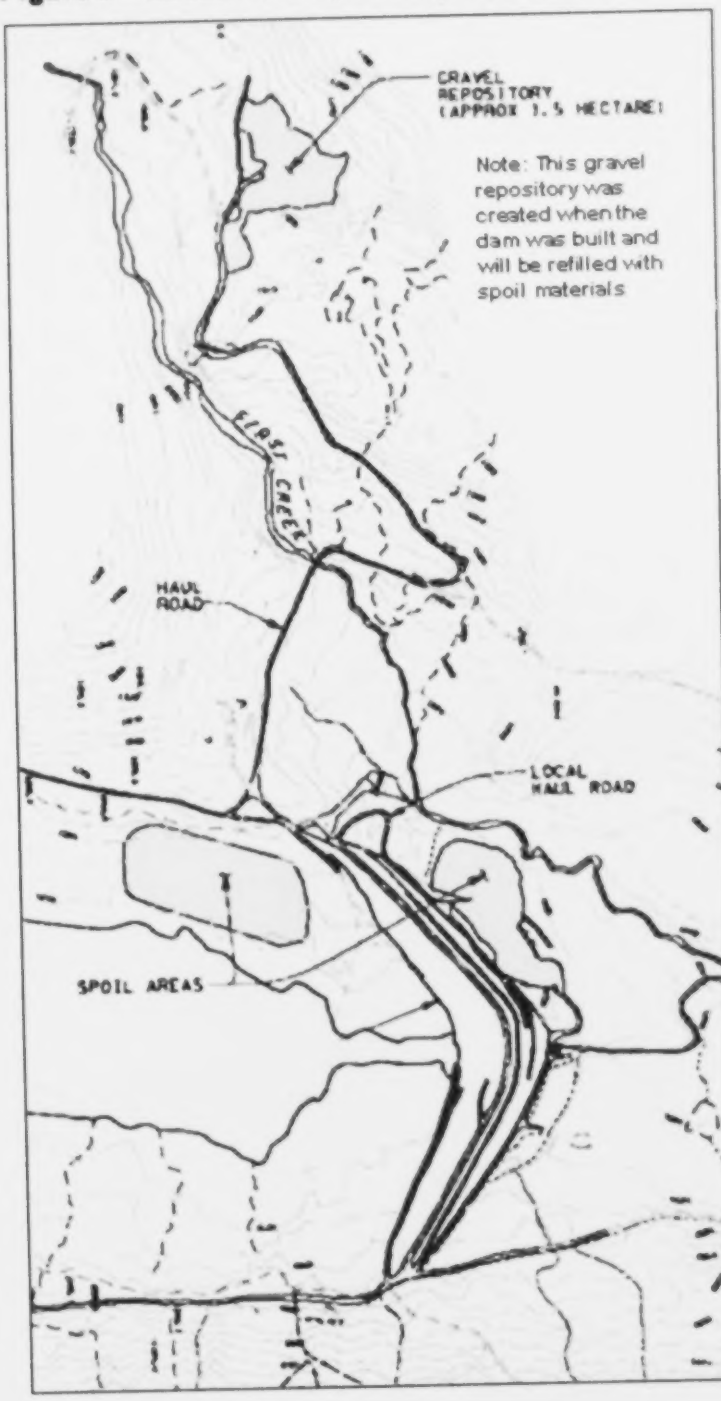

FREE OVERFLOW SPILLWAY AND STILLING BASIN
REMNANT OF ORIGINAL SPILLWAY
Excavations begin from this side
Location of the plug
INTAKE
EXTENT OF ORIGINAL COURSTER LAKE AT EL 1268 m
SOUTH COURTENAY CREEK
VALVE HOUSE
LOW LEVEL OUTLET
MAXIMUM NORMAL RESERVOIR LEVEL EL 1283.8
DAM CREST EL 1285.3
MAXIMUM NORMAL OPERATING LEVEL EL 1274.3
TO SHELTER BAY

Figure 3 – Location of Spoil Disposal Areas


GRAVEL
REPOSITORY
(APPROX 1.5 HECTARES)
Note: This gravel repository was created when the dam was built and will be refilled with spoil materials
FIRST CREEK
HAUL ROAD
LOCAL HAUL ROAD
SPOIL AREAS

One letter from the public was received during the review and commented on the loss of gravels and fines in Lower Cranberry Creek and fluctuations in flows from operation of the WHGS. In a written response, BC Hydro noted that construction of Coursier Dam likely had minimal effect on the movement of gravel from the lake to downstream portions of Cranberry Creek and that operations of the generating station would be addressed as part of the Water Use Planning process. BC Hydro committed to ensure that this concern would be forwarded to the Water Use Planning project team for consideration. The EAO also contacted the member of the public to advise that the matter of impacts to water levels in Lower Cranberry Creek from operations at the WHGS was beyond the scope of the current review and forwarded a copy of a fisheries and hydrology study conducted on Cranberry Creek below the diversion dam.

The EAO is satisfied that public comment received during the environmental assessment process has been properly considered.

5.2 First Nation Participation During the Environmental Assessment Review

During an environmental assessment under the Act, First Nations have opportunity to participate in the identification and discussion of project issues with government and to have proponents to consult with them. The EAO is the lead government agency responsible for ensuring that the government's legal obligations towards First Nations are fulfilled, including consideration of and attempts to address First Nation interests.

Under CEAA, "environment" is defined in biophysical terms. However, the definition given for "environmental effects" is broader and includes "*...any change that the project may cause in the environment, including any effect of such change on the current use of lands and resources for traditional purposes by aboriginal persons...*". Accordingly, the current use of lands for traditional purposes was considered in this CEAA screening.

The Coursier Dam is located within an area identified as traditional territory by the Okanagan Nation and the Shuswap Nation. In Section 6 of the Application, BC Hydro reports that as part of pre-application communication it contacted the Okanagan Nation Alliance (ONA), Shuswap Nation Tribal Council and Canadian Columbia River Intertribal Fisheries Commission (CCRIFC) to outline the scope of the proposed project.

Specific issues identified by First Nations during the review of the Application and measures proposed by BC Hydro to address these issues are included in Appendix 2 - *Summary and Status of Issues Identified in Agency, First Nation and Public Comments* and are incorporated into section 6 of this assessment report.

Participation by the Shuswap Nation

The Shuswap Nation indicated to BC Hydro that the Secwepemc Fisheries Commission (SFC) along with CCRIFC would represent the Nation's fisheries interests during review of the Application.

The SFC and CCRIFC participated in four teleconferences organized by the EAO during the course of the assessment. The first teleconference, held on January 24, 2003, outlined the requirements of the Act, described the process for the review of the Application and evaluated BC Hydro's program of notification and information distribution.

Subsequent teleconferences (March 7, March 26, April 7, 2003) were meetings of the Technical Issues Working Group (TIWG) where the status of project issues, content of the proposed revegetation plan, restoration channel design and draft Environmental Management Plan were discussed with BC Hydro representatives. The results of these meetings are incorporated into section 6 of this assessment report.

SFC and CCRIFC provided written comments on the Application to the EAO on February 17, 2003. The SFC provided additional written comments regarding the design of the restoration channel to BC Hydro on March 24, 2003, which were discussed at the TIWG meeting of April 7, 2003 and to which BC Hydro has committed to respond.

Participation by the ONA

ONA participation in the review was guided by the ONA's Natural Resource Department. During January 2003, the ONA and BC Hydro attempted to reach agreement on a capacity funding agreement to support Okanagan Nation participation in the environmental assessment of the project. In a letter received by the EAO on February 10, 2003, the ONA requested the EAO to mediate ongoing discussions between the ONA and BC Hydro to help facilitate an agreement. On March 13, 2003, after ongoing discussions with the ONA and BC Hydro, the EAO tabled a proposal with objectives and levels for capacity funding that was acceptable to both the ONA and BC Hydro.

The ONA provided written comments on the Application on March 31, 2003 and participated in three of the four teleconferences organized by the EAO (January 24, March 7, April 7, 2003). BC Hydro provided a written response to the ONA's written comments on April 7, 2003 and the EAO convened a teleconference with the ONA and BC Hydro on April 14, 2003 to discuss the status of the comments and responses.

5.3 Status of Notification, Information Distribution and Consultation Measures

The order issued under section 11 of the Act for the scope, procedure and methods of the assessment of the Coursier Dam Decommissioning Project outlined measures for notification, information distribution and consultation to be carried out by BC Hydro and the Environmental Assessment Office (EAO) and the status of these measures is as follows:

1. BC Hydro was required to distribute copies of the Application as per the mailing list provided to BC Hydro by the EAO on December 13, 2002. This measure was completed as specified.

2. BC Hydro was required to advertize the availability of the Application for review and the time limits for public comment in two consecutive editions of the *Revelstoke News* and the *Revelstoke Times Review*, with the first of the four notices to appear at least 7 days prior to the start of the public comment period. This measure was completed as specified.

3. BC Hydro was required to give public notice of where and when any open house or public meeting required by the Executive Director will be held. No additional open houses or public meetings were required by the Executive Director.

4. BC Hydro was required to complete any additional measures for notification or consultation specified by the Executive Director. This measure was completed as specified.

5. The Executive Director committed to hold a public comment period on the Application from January 13, 2003 to February 17, 2003. This measure was completed as specified.

6. The Executive Director committed to invite all levels of government and First Nations in the vicinity of the Project to submit comments on the Application within the time limits for the public comment period. This measure was completed as specified.

7. The Executive Director was required to evaluate the adequacy of the Proponent's program of First Nations and public consultation and provide the results of that evaluation to the Proponent by January 27, 2003. This measure was completed as specified.

8. BC Hydro was required to complete any additional measures for notification or consultation specified by the Executive Director. This measure was completed as specified.

6.0 Consideration of Project Effects

6.1 Environmental Effects

6.1.1 *Fish and Fish Habitat*

Sections 4.4 and 5.4 of the Application describe the potential impacts of the project on fish habitat and proposed mitigation measures. The main activities with the potential for adverse impacts to fish and fish habitat are the excavation of the notch in the dam, disposal of spoil materials and restoration channel construction. Potential impacts of these activities on water quality are discussed in section 6.1.4 of this report. Figure 4 shows the area to be excavated from the dam and the conceptual design for the restoration channel.

The restoration channel will provide more stream channel and potential for rainbow trout spawning in South Cranberry Creek than existed prior to dam construction and will restore fish migration between the lake and lower sections of South Cranberry Creek to pre-dam conditions.

Dam decommissioning will increase spring and summer flows into lower South Cranberry Creek and reduce winter flows relative to recent regulated operations but will return flows to pre-dam conditions for which original fish stocks were adapted. Increased flows through the low level outlet during the spring and early summer of 2003 and the use of supplementary pumps creates the potential for higher than normal numbers of rainbow trout to be entrained into South Cranberry Creek during reservoir drawdown and coffer dam construction. BC Hydro proposes to mitigate potential entrainment impacts through fish salvage and exclusion netting measures to be specified as part of the final Environmental Management Plan.

The decommissioning of Coursier Dam will remove the ability to regulate the flows of South Cranberry Creek and to supplement the flows to the WHGS. While the natural lake will provide some storage and attenuate the flows downstream following decommissioning, the over winter flow releases into South Cranberry Creek will be less than they are under regulated conditions. The effect of the diversion facilities at the WHGS headpond will be similar to existing circumstances.

The EAO and DFO agree that assessment of the operations of the WHGS are beyond the scope of the current review and will be considered under a water use planning process for the WHGS that seeks to balance the interests of the multiple users of the water resources. The interests that have been identified to date for consideration in the water use planning process include instream flow releases from the WHGS diversion dam and the frequency of headpond spillway operation.

After the dam is decommissioned Coursier Lake will revert to its natural pre-dam area and elevation or approximately 72% of the volume of the current operational level of the reservoir. While this will result in reduced lake habitat availability for fish, re-establishing the natural lake has potential to create fish habitat that is more productive on a per unit area basis than the reservoir operations have allowed. No Net Loss of the productive capacity of fish habitat in Coursier Lake likely can be achieved relative to the pre-dam conditions over the long term.

BC Hydro has committed to complete a Fish and Fish Habitat Mitigation and Compensation Plan as part of its Environmental Management Program and to implement the plan to achieve No Net Loss of the productive capacity of fish habitat for the South Cranberry Creek/Coursier Lake system relative to pre-dam conditions.

Generally, BC Hydro proposes to mitigate/compensate for impacts to fish not directly caused by the decommissioning works (non-construction impacts) by:

a) Construction of riffle-pool habitat below the lake;
b) Enhancing the rate of riparian restoration of Coursier Lake and tributaries through a revegetation program; and
c) Restoring and monitoring stream habitat in tributary streams.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; government agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that BC Hydro can implement mitigation and compensation measures to address the potential adverse effects of the project on fish and fish habitat

6.1.2 *Wildlife and Wildlife Habitat*

Sections 4.6 and 5.6 of the Application describe the potential impacts of the project on wildlife and wildlife habitat and propose mitigation measures. The construction phase of the decommissioning work will result in a temporary increase in noise, traffic and activity in the vicinity of the dam. This activity is tentatively scheduled to occur from late June 2003 to early November 2003 depending on inflows to the lake and weather conditions. The short-term effects to mammals, amphibians, and reptiles are not expected to be significant because there is abundant adjacent habitat for these species within the Coursier Lake Reservoir basin and adjacent watersheds. The Monashee Mountain Caribou population is generally located north and west of the Coursier project area and there are no concerns regarding possible effects of construction activities on ungulate movement patterns.

When completed, the project will restore approximately 147 hectares of valley bottom wildlife habitat that prior to flooding consisted of approximately 82 hectares of forest and 65 hectares of marsh and scrubland. The restoration of this habitat will be gradual, following natural succession over many years, and upon completion will resemble the pre-dam habitat. It is anticipated that

wildlife species will quickly colonize the newly available habitat and that wildlife densities will gradually increase as the plant communities become established, benefiting a large variety of mammal, bird, and amphibian species.

BC Hydro does not anticipate that restored wildlife habitat would result in the presence of new species because colonization of the restored habitat would occur from within the Cranberry Creek watershed and adjacent areas.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; government agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that BC Hydro can implement environmental management and revegetation plans to avoid or address potential adverse effects to wildlife and restore terrestrial habitat to benefit a variety of wildlife species.

6.1.3 *Birds*

Sections 4.6 and 5.6 of the Application also discuss the potential impacts of the project on birds and propose mitigation measures. Environment Canada has recommended that vegetation clearing and related disturbance activities proceed outside of the April 15 – July 31 breeding bird season. BC Hydro notes that the short work window and requirement to complete the excavation of the notch in one summer season will require clearing of vegetation in spoil areas once equipment can access the area (late June to July). Previous site visits did not identify nesting birds within the project area and no bird nests are suspected to occur in the valve house as the area has been screened-off to prevent this.

To ensure that project construction, including quarry activities, does not adversely impact nesting birds, BC Hydro will retain an Environmental Monitor who will conduct a survey for bird nests within the work area immediately prior to starting construction work. Trees slated for removal will be removed as early in the construction period as possible, to avoid effects on established nests. Removal of veteran trees and snags will be avoided when possible.

At the quarry site, blasting, sorting and hauling will start as soon as site access allows and will continue until mid-summer which may deter birds from nesting in the vicinity of the quarry. BC Hydro anticipates that blast charges will be relatively small, underground and less likely to disturb birds in the vicinity.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; government agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that BC Hydro can implement environmental management and revegetation measures to avoid or address potential adverse effects to birds and provide a net benefit to bird habitat.

6.1.4 *Water Quality*

Sections 4.3 and 5.3 of the Application discuss the potential impacts of the project on water quality and propose mitigation measures. During dam decommissioning, increased levels of total suspended solids (TSS) in project area waters are a potential adverse effect resulting from:

- Rewatering of dewatered areas such as the restored outlet channel following construction;
- Sediment laden run-off entering the watercourses (Coursier Lake Reservoir, First Creek and South Cranberry Creek); and
- Agitation of water during notch and channel construction-related activities.

BC Hydro predicts that careful planning and execution of an erosion and sediment control plan will minimize the potential water quality effects such as elevated TSS and turbidity within Coursier Lake, First Creek and Lower South Cranberry Creek. Detailed design drawings of construction areas around the dam, the spoil areas and any road upgrades will include the layout of current drainage patterns in those areas and the preliminary layout of erosion and sediment control measures to be applied. Good management practices such as the use of sediment fences, straw bails, and sediment ponds will be employed during the decommissioning works. Timely reseeding of exposed soils, covering temporary stock piles of fine material with geotextile can also minimize and mitigate impacts.

BC Hydro will regularly monitor TSS levels at designated sampling stations including:

- Upper Cranberry Creek above the reservoir;
- Immediately upstream of the construction area (reservoir outflow);
- Immediately downstream of the construction area (below outlet channel); and
- Cranberry Creek immediately downstream of the confluence with First Creek.

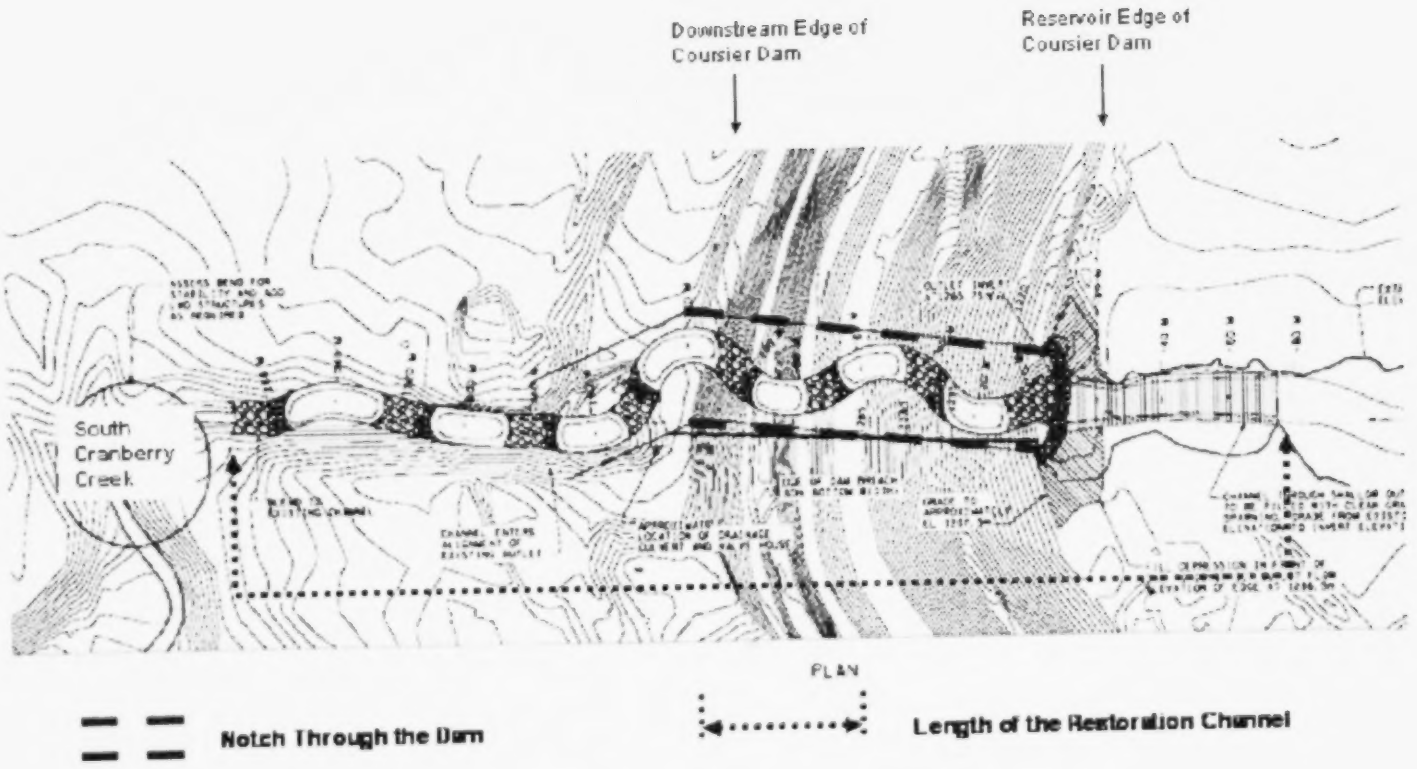
If suspended sediments leaving the construction area are above regulatory guideline levels, additional water quality monitoring will be done in Cranberry Creek at the WHGS headpond, at the Highway 23 bridge crossing, and at the lower reach of Cranberry Creek immediately above Arrow Lake.

Sedimentation and other effects on water and fish habitat will also be minimized during decommissioning by carrying out work in the dry (outlet channel restoration for example). Spill contingency planning will minimize the potential for water quality effects resulting from fuel spills and other accidents. All refuelling of equipment will be required to take place 30 metres away from watercourses.

Some explosives will be used to break up the concrete in the spillway, at the valve house and the low level outlet. Explosives will not be used in the water and any blasts near fish bearing waters will be carefully controlled to ensure over pressures and vibrations reaching the water bodies are within the guidelines for the protection of fish.

It is unlikely that rock excavated from the notch of the dam would have acid generating potential but it will be tested prior to the start of excavations to confirm this. If re-exposing this material could decrease the pH (increase the acidity) of water in the work area, this issue will be addressed prior to the start of any excavation activities.

FIGURE 4 – Location of the notch and restoration channel



BC Hydro's draft Environmental Management Plan proposes that onsite environmental monitoring will be undertaken by an Environmental Monitor who will be a qualified professional, will remain on site for any environmentally sensitive work and will have the responsibility and authority to shut down job activities in the event of any environmental damage.

In response to concerns expressed by the SFC and CCRIFC, BC Hydro has committed that if excavated dam material (spoilage) is deposited in Spoil Area A, the berm of the existing dyke of Spoil Area A will be raised as necessary to mitigate risk of sediment releases into First Creek.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; government agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that BC Hydro has identified and assessed the potential impacts of the project on water quality and can implement appropriate measures to avoid or address any potential adverse effects.

6.1.5 *Vegetation*

Sections 4.5 and 5.5 of the Application discuss the potential impacts of the project on vegetation and propose mitigation measures. Decommissioning the dam will restore approximately 147 hectares of terrestrial habitat previously flooded by the reservoir (82 hectares of forest, 65 hectares of marsh and scrubland). Revised Figure 22, submitted by BC Hydro to the EAO on March 6, 2003, is an overview of the revegetation strategy (Figure 22 attached as Appendix 4).

After completion of the excavation of the notch in the dam and construction of the restoration channel, BC Hydro proposes to implement a revegetation strategy that combines natural and artificial methods of regeneration to re-establish vegetation communities in the reservoir and outlet area similar to those that existed prior to inundation. In Area A the strategy includes revegetation of the slopes adjacent to South Cranberry Creek, Coursier Lake, Westside Creek and (former) low level outlet with locally harvested willow, cottonwoods (and conifers at suitable microsites) to establish a functioning riparian zone. In Area B, previously non-forested areas would be left for natural regeneration. In Areas C and D, BC Hydro would attempt to return the land area above El. 1274 metres to a conifer dominated habitat type. The prepared sites would be planted with a mix of Englemann spruce, subalpine fir and western red cedar. BC Hydro predicts that, as they revegetate, re-exposed areas in the reservoir, riparian channel and construction zones will provide forage and cover to various terrestrial animals.

BC Hydro also proposes that approximately 10 hectares of construction area (spoil, temporary laydown, quarry, gravel repository, dam, and other disturbed areas) would be planted with a mix of conifers and shrub species depending on the cover material. BC Hydro field observations have not identified the presence of noxious weeds in the area and for this reason, BC Hydro does not propose to develop a Noxious Weed Management Plan.

BC Hydro will be required, post-decommissioning, to conduct vegetation surveys over a 10 year period to monitor growth of plants, establish the performance of planted seedlings, chart early natural succession of the vegetation communities and monitor development and function of artificially established communities. If surveys show that areas are not regenerating adequately, additional measures may be taken to assist with restoration. BC Hydro predicts that the project's long-term potential effects to vegetation will be relatively small.

In their respective reviews of the revegetation strategy, the Ministry of Water, Land and Air Protection, Ministry of Forests, DFO, the ONA, CCRIFC and the SFC commented on: the planting mix for trees, shrubs and grasses; the appropriate width for riparian buffers adjacent to streams and tributaries; the location and extent to which conifers should be planted in Area B; measures to avoid introduction of noxious weeds; and inclusion of First Nation traditional use species in the revegetation prescription. The TIWG discussed these issues with BC Hydro with the following results.

The proposed (minimum) ten metre riparian buffer in Area A is acceptable provided that, as part of the Environmental Management Plan, BC Hydro monitors lateral bank stability; conducts fish habitat and spawning habitat assessments, provides monitoring reports to interested agency and First Nation representatives and implements remedial measures where long term problems are identified.

The overall strategy proposed by BC Hydro, including the current prescription for Area B, (leaving Area B to revegetate naturally) is acceptable for the purposes of this environmental assessment. Over time, conifers would re-establish through natural succession. Area B consists of approximately 61 hectares of land where, prior to dam construction, conifers were dispersed and a wetland habitat existed. The area was later logged and then flooded by the filling of the reservoir. Ministry of Forest has advised the EAO that the project area is coded as having low biodiversity emphasis and no special designations apply to land use in the area (e.g. protected area or special management zone designations). During the review of the Application, the TIWG considered whether active planting of conifers at suitable sites within Area B could accelerate a return to levels of biodiversity that existed prior to inundation. The TIWG agrees that the marshy terrain in Area B requires several years of continued effort (planting, re-planting and annual brushing) to successfully introduce conifers and that the relative costs and benefits of this approach should be further examined, post-environmental assessment, through a process directed by the EAO in consultation with the TIWG and BC Hydro.

To manage the risk of introducing noxious weeds, BC Hydro and its contractors will commit to inspect and clean all equipment and vehicles before entry to the project area. The revegetation program will include monitoring for project site weed infestations and BC Hydro will recommend and implement management control options where necessary. BC Hydro has also committed to consider planting traditional species, subject to costs and availability of appropriate species and is currently trying to identify and locate these plants. More information on traditional use species is expected in May 2003 when the proposed traditional use studies are completed (see section 6.2).

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; government agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that BC Hydro's proposed revegetation strategy and monitoring program commitments are appropriate for the restoration of vegetation in the project area and avoidance of potential adverse effects. Further review of the issue of conifer planting in Area B is not required prior to a decision on the Application.

6.2 Heritage Values

A. Archaeological Resources

The project is situated within an area identified as traditional territory by the Okanagan Nation and the Shuswap Nation. An archaeologist acceptable to the Okanagan Nation Alliance and the Shuswap Nation Tribal Council completed a field reconnaissance of the Coursier Dam site on November 4, 2002 and the report was included as Appendix C-6 of the Application.

The report concluded that while the area within and adjacent to the reservoir has been disturbed to varying degrees by logging, borrow pitting, road construction, reservoir clearing and the wave action of the reservoir, there remain some areas with the potential for buried archaeological resources.

The excavation and disposal of material from the dam is not predicted to pose a risk of significant adverse effects to archaeological resources because the material to be excavated and the associated disposal sites are all previously disturbed. The main potential for impacts to archaeological resources would be from ground disturbance activities associated with the revegetation program.

To avoid impacts to archaeological resources, BC Hydro has committed to complete an Archaeological Impact Assessment of the land area that will be re-exposed upstream of Coursier Dam after the reservoir reverts to the pre-dam level of El. 1266 metres from the current level of El. 1274 metres.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that completion of the Archaeological Impact Assessment prior to the start of the revegetation program will provide the information required by BC Hydro to avoid potential adverse effects to archaeological resources.

B. First Nation Interests

As reported in section 6 of the Application, BC Hydro held pre-application meetings and discussions with the Okanagan Nation Alliance and Shuswap Nation Tribal Council and was advised that both First Nations were interested to conduct studies of their respective traditional uses of the project area. BC Hydro has agreed to provide funding to enable this.

The ONA and BC Hydro have since finalized an agreement for completion of a Traditional Use Study, the results of which will be available in draft form by the end of May 2003. The Shuswap Nation Tribal Council directed BC Hydro to the SFC which advised that the TUS would be conducted at the band level. The Spallumcheen First Nation contacted BC Hydro in mid-January 2003 to express an interest in conducting the TUS and is currently developing a proposal in cooperation with the SFC that BC Hydro anticipates will be available by early May 2003.

BC Hydro has committed that, when finalizing the revegetation program during the summer of 2003, it will take into account any available information from the traditional use studies and will include traditional use species in the revegetation program where economically and technically feasible.

The Okanagan Nation and the Shuswap Nation also identified an interest to access employment opportunities associated with the decommissioning and revegetation works. BC Hydro reported in the Application that it will write to each First Nation to outline economic opportunities and work with each First Nation throughout all phases of the project to ensure that economic development opportunities are provided.

BC Hydro has committed to provide identified contractors from the First Nations, along with local contractors from the region, with opportunities to bid on any work that will be forthcoming from this project and provide First Nations with as much advance information as possible on tenders to be issued so contractors can prepare their bidding strategies. BC Hydro also intends to direct a good portion of the construction work at Coursier Dam using local construction equipment. Equipment will be obtained through contractors on a rental agreement basis, which includes a process for competitive price bids.

On March 24, 2003 the SFC provided supplementary comments to BC Hydro regarding the detailed design of the restoration channel. At the TIWG meeting on April 7, 2003, the EAO clarified that issues of detailed design are normally addressed during the permitting process. For the purposes of the environmental assessment, the conceptual design information in the Application, combined with clarifications from BC Hydro in supplementary written comments and during TIWG meetings, is sufficient. BC Hydro has agreed that, once available, it will provide copies of the detailed design to the SFC and the ONA who may then direct any additional comments to DFO and the Comptroller of Water Rights for consideration as part of the permit/authorization process.

On April 17, 2003, in comments on the draft assessment report, the ONA stated it would like to see more discussions on the actual size of the notch in the dam because the ONA's Fisheries Department believes that extending the size of the notch could have positive effects to fish habitat and stream stability.

For the purposes of the environmental assessment review, the EAO and DFO are satisfied with the conceptual designs provided by BC Hydro for excavation of the notch and construction of the restoration channel. The detailed designs will be subject to review and approval by DFO and the Comptroller of Water Rights and BC Hydro has agreed to provide copies of the detailed design to the ONA and the SFC who may then direct any additional comments to DFO and the Comptroller of Water Rights.

6.3 Social and Economic Values

Sections 4.7 and 5.7 of the Application discuss the potential social and economic impacts of the project. The dam is located in an isolated valley thirty kilometres from the City of Revelstoke. A temporary increase in local jobs (up to seven person years) and related local purchasing during the construction period will create a temporary local economic benefit. Worker health and safety issues during construction will be addressed in the Environmental Management Plan. No work camps will be required for the project.

Recreational activities near the reservoir include camping, hunting, fishing, backcountry skiing, snowmobiling, use of All Terrain Vehicles (ATV), snowshoeing, hiking, berry picking and fishing. Coursier Lake supports a modest summer sport fishery and winter ice fishery for local residents.

In public, agency and First Nation comments received on the Application, no potential adverse social or economic impacts were identified.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that no potential adverse social or economic effects from the project are predicted.

6.4 Dam Safety and Accidents and Malfunctions

Land and Water British Columbia Inc. (LWBC) has the authority to establish and enforce provincial dam safety standards. LWBC will base its review of the decommissioning project on the Dam Safety Regulation, Section 9, which deals with suspension of normal operation or removal of a dam and requires that BC Hydro prepare and submit a plan for the removal of the dam to a Dam Safety Officer of LWBC for review and approval. BC Hydro has indicated that the plans for the breach in the dam embankment are in the design stage at present. BC Hydro will submit all final decommissioning plans for identification and management of dam safety issues to the Dam Safety Unit of LWBC for review and approval prior to the start of the project and implement all approved plans to the satisfaction of LWBC.

Sections 2.4 and 4.11 of the Application discuss the potential risks during construction. The potential for flooding from unseasonably high rainfall or snowmelt is the greatest risk to be managed during excavation of the notch. The period where floods are most likely to occur is during the freshet between May and July. The construction strategy will include an assessment of the risk of flooding, with no excavations commencing until the spring flood period has passed. BC Hydro will evaluate the remaining snowpack in the watershed and seasonal weather conditions prior to commencing construction. Flood contingency planning measures will be included in the Environmental Management Plan.

BC Hydro will also have an emergency response plan for the construction period that documents procedures to be followed in the unlikely event of the occurrence of an extreme storm during the construction and will undertake post-project monitoring of environmental and safety aspects of the project as required.

Construction methods and resources will be sufficient to complete the excavation phase of the project and installation of the restoration channel within thirty-five days. This will provide considerable flexibility in mitigating weather and construction delays considering potentially three months may be available to complete the work (late July to late October). Once reservoir levels drop below the invert of the spillway all flows must be passed through the low level outlet or pumped over dam. If inflows exceed the combined outflow capacity, the reservoir could rise quickly and overtop the excavation, leading to dam failure.

Total outflow capacity of the outlet is about four cubic metres per second when the reservoir is at the current operating level of El. 1274 metres with outflow volume reduced to 1.8 cubic metres per second when the reservoir is at El 1266 metres. A supplementary surface pump

could provide an additional one cubic metre per second of pumping capacity. Further protection against unexpected higher inflows to the reservoir can be provided by raising the level of plug.

Spills are another potential risk during project implementation. The Environmental Management Plan will include an emergency spill response plan and measures to avoid spills. BC Hydro has committed to require contractors use biodegradable hydraulic fluid in all equipment working below high water level, where feasible, to further mitigate impacts from a potential spill.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; government agency, First Nation and public comments on the project; responses from BC Hydro and the discussions of the TIWG Based on this information, the EAO and DFO are satisfied the issue of potential adverse impacts from accidents and malfunctions has been addressed and that the final details of construction and environmental management, emergency response and other measures to ensure dam safety can be resolved at permitting/authorization.

6.5 Navigation

Canadian Coast Guard has advised DFO that Coast Guard will provide a 'Work Assessment' under section 5(2) of the *Navigable Waters Protection Act* at the permitting stage of the project and that BC Hydro will not require a permit under section 5(1).

In response to comments from the Canadian Environmental Assessment Agency, BC Hydro discussed the issue of project impacts on recreational boater safety. The drawdown of Coursier reservoir to pre-dam conditions will be gradual and will not expose or create new obstacles which could pose a hazard to boaters (e.g. shore line elevation, bathymetry, rocks, stumps or debris). The lake outlet section and the restored stream channel downstream of the lake will be shallow and visible. BC Hydro will also post warning signs on the access road to Coursier Lake and in the vicinity of the decommissioned camp site located at the upstream end of the reservoir. BC Hydro has previously and effectively implemented these public safety measures during dam safety repairs when Coursier Lake reservoir was drawn down below El. 1266 m.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; government agency, First Nation and public comments on the project; responses from BC Hydro and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied the issue of boater safety has been resolved.

6.6 Cumulative Environmental Effects

The review of cumulative effects considers the environmental effects of the Project in relation to other past, existing or imminent projects or activities. This is required as part of a screening under CEAA. BC Hydro reported on the anticipated cumulative environmental effects assessment of the project in section 5.11 of the Application. In its comments on the Application, DFO requested that the environmental effects of construction and operation of the Coursier Dam also be scoped into the cumulative environmental effects assessment.

BC Hydro provided additional reporting on the construction and operation of the Coursier Dam to the EAO on March 20, 2003 and concluded that the cumulative effects of the decommissioning project in combination with other past and future known projects would be

either neutral or positive for fisheries, vegetation and wildlife. DFO has reviewed this additional reporting and is satisfied with BC Hydro's response and conclusion.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; agency, First Nation and public comments on the project; responses from BC Hydro; and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that, combined with the measures to be implemented as part of the Water Use Planning process, the cumulative effects of the project have been satisfactorily assessed and would be either neutral or positive for fisheries, vegetation and wildlife.

6.7 Effects of Environment on Project

For the purposes of the CEAA screening, the review has considered the potential for effects to the project from the environment and the results are presented in this assessment report. The main potential for an effect to the project from the environment would be unseasonably heavy rains or increased snow melt during the excavation of the notch in the dam resulting in rising reservoir levels and the risk of flooding. BC Hydro has considered and addressed this potential effect in Section 4.2 of the Application and will implement risk management measures through an emergency response plan as part of environmental management planning. BC Hydro's contingency planning acceptably addresses potential effects of the environment on the project. (See also Section 6.4 of this assessment report.)

6.8 Mitigation of Environmental Effects

In section 4.11 of the Application, BC Hydro committed to prepare an Environmental Management Plan. BC Hydro provided a draft of the plan to the EAO on March 4, 2003 which was then circulated to government agencies and First Nations for comment. After discussions with the TIWG, the EAO and DFO consider that the draft Environmental Management Plan, and commitment by BC Hydro to continue discussion with government agencies and First Nations when finalizing the draft plan, are satisfactory for the purposes of this environmental assessment. BC Hydro will finalize the Environmental Management Plan for post-environmental assessment permitting requirements and will circulate the final draft of the Environmental Management Plan to interested government agencies and First Nations for review and comment.

7.0 Follow-Up and Monitoring

BC Hydro will include plans for follow-up and monitoring as part of the final Environmental Management Plan. Onsite environmental monitoring will be undertaken by a qualified professional who will attend any pre-job meetings to ensure the contractors understand the requirements of the Environmental Management Plan and the sensitivities of the work site. The Environmental Monitor will work closely with an Environmental Coordinator and onsite construction supervisor and officers and visit the site regularly to:

- Ensure compliance with the Environmental Management Plan;
- Assist with the Emergency Response Contingency Plan, if necessary;
- Address any environmental problems;
- Identify and report any emerging environmental issues;

- Keep records of inspections and make regular reports to the project manager; and
- If necessary, meet with environmental agency personnel and other stakeholders.

The Environmental Monitor will be on site for any environmentally sensitive work and remain on call during working periods to respond to any environmental emergencies that may arise. The Environmental Monitor will liaise with the BC Hydro Construction Officer and report details of site visits or any environmental concerns. The environmental monitor and construction officer will have the responsibility and authority to shut down decommissioning activities if they perceive that environmental requirements and standards may not be met.

BC Hydro will be required to monitor and report on the revegetation program, restoration channel and other works for up to ten years upon completion of the dam decommissioning. Timeframes for ongoing project monitoring by BC Hydro may be adjusted where the appropriate federal or provincial permitting authority considers necessary.

Conclusion: During this cooperative environmental assessment the EAO and DFO have considered: the Application; agency, First Nation and public comments on the project; responses from BC Hydro and the discussions of the TIWG. Based on this information, the EAO and DFO are satisfied that plans and timeframes for project and post-project monitoring will be satisfactorily developed as part of the Environmental Management Plan and implemented.

8.0 Permits, Licences and Authorizations

BC Hydro submitted its Application in December 2002 prior to the introduction of the new *Environmental Assessment Act* S.B.C. 2002, c.43. Upon proclamation of the new Act, Transition Order #02-03 required that assessment of the Application be continued and disposed of as an application for an environmental assessment certificate. The Act allows a proponent to apply for concurrent review of one or more applications for approvals under other enactments required to carry out the project. Accordingly, BC Hydro requested that two permit applications it filed with LWBC under the *Land Act* be reviewed concurrently with the Application.

The EAO accepted BC Hydro's request on January 8, 2003 and posted copies of the permit applications on the Project Information Centre for public comment during the public comment period on the Application. Ministry of Forests observed that the permit application for the quarry at kilometre 17 was for approximately nineteen hectares while the Application referred to a quarry area of approximately two hectares. On February 20, 2003 BC Hydro amended its permit application for the quarry to match the two hectares referenced in the Application. LWBC has advised the EAO that no additional information is required from BC Hydro for LWBC to complete its review of the permit applications. Appendix 1 summarizes various approvals anticipated should BC Hydro receive an environmental assessment certificate for the decommissioning project.

COURSIER DAM DECOMMISSIONING PROJECT

ASSESSMENT REPORT

APPENDICES

APPENDIX 1

PERMITS, LICENCES AND AUTHORIZATIONS

APPENDIX 1 – PERMITS, LICENCES AND AUTHORIZATIONS

This Table lists the various federal and provincial statutory requirements under which permits, licences or authorizations are anticipated if an environmental assessment certificate for the project is granted to BC Hydro.

Statutory Authority	Permit/Licence/Authorization	Lead Ministry or Agency
Federal		
Explosives Act	Explosives Licence(s) to quarry rock and break-up the existing concrete structures at the dam.	Natural Resources Canada
Fisheries Act S35(2) and S.32	Harmful alteration, disruption or destruction of fish habitat and killing of fish by means other than fishing.	Fisheries and Oceans Canada (DFO)
Navigable Waters Protection Act	Exemption under Section 5(2) but no permit required	Canadian Coast Guard
Provincial		
Commercial Transport Act	Oversize/Overweight Vehicles Permit	Ministry of Transportation
Fire Services Act	Storage and Dispensing of Fuels	Community, Aboriginal and Women's Services
Forest Act	Licence to Cut	Ministry of Forests
Land Act	Licence of Occupation for spoil disposal areas and quarry	Land and Water British Columbia Inc.
Mines Act	If the quarry meets the definition of a mine BC Hydro will require explosives use and storage permit, certification of blasters, shifboss certificates (if greater than 6 people working the quarry) and a permit under section 10 (mine plan, program for protection of the land and watercourses, and reclamation).	Ministry of Energy and Mines
Utilities Commission Act	Certificate of Public Convenience and Necessity	British Columbia Utilities Commission
Water Act	Changes in and about a stream	Land and Water British Columbia Inc.
Wildlife Act	Scientific Collection Permit for any fish salvage conducted	Water Land and Air Protection

APPENDIX 2

SUMMARY AND STATUS OF ISSUES IDENTIFIED IN AGENCY, FIRST NATION AND PUBLIC COMMENTS

Comment/ Issue	BC Hydro Response	EA Status
Fish and Fish Habitat		
Recommend complete dam removal to allow for natural stream movement across the flood plain over time. (SFC/CCRIFC)	Excavating the notch through the dam will be about $3 million and involve the disposal of approximately 105,000 cubic metres of material. Complete removal of the dam, including concrete structures would involve the spoiling of over 400,000 to 500,000 cubic metres of material. The cost would make decommissioning impractical & uneconomical.	Response Satisfactory Issue Addressed
Recommend no riprap be used at all in the restoration of the channel downstream of Coursier Lake. (SFC/CCRIFC)	With regard to the reach of South Cranberry Creek that would be restored from the outlet of Coursier Lake (upstream of the current dam position) to the confluence with First Creek, rip rap (rock material greater than 600 mm in diameter) would be used only along the edge of the excavated floodplain to prevent erosion of the remaining dam material. The long-term stability of the floodplain is a major requirement for BCH. We have no plans to use riprap in the actual restored, sinuous channel.	Response Satisfactory Issue Addressed
Fish salvage should be conducted in Cranberry Creek below the Walter Hardman Diversion Dam if all flow from Cranberry Creek is diverted to the Walter Hardman Headpond (i.e. no water spilling over diversion dam). This is especially important due to the high likelihood of increased entrainment of fish from Coursier Lake into South Cranberry Creek as a result of opening the Low Level Outlet. (WLAP)	Rainbow trout entrained during reservoir drawdown will likely redistribute throughout the Cranberry Creek system including South Cranberry Creek above the Walter Hardman headpond diversion, the headpond, Cranberry Creek below the diversion, and Arrow Lake. The rainbow trout ending up in Cranberry Creek below the diversion will move downstream to Arrow Lake or into pools as the water spilling over the diversion reduces. Fish salvage in this reach is not practical due the length (12 km) and the presence of many deep pools and canyons. Long term issues regarding the operation of Walter Hardman GS and flows in Lower Cranberry Creek will be investigated as part of the Water Use Planning process, scheduled to begin in spring 2003.	Response Satisfactory Issue Addressed
Intake screens compliant with DFO's intake screening guidelines would be required for water diversion pumps. (DFO)	Section 4.1.2 of the EMP proposes that all pumps will be fitted with intake screens compliant with DFO's intake screening requirements.	Issue Addressed
Blasting of the valve house should occur prior to fish being re-introduced to the channel. (DFO)	To reduce risk to the aquatic environment, all work will be done in the dry by staging excavations and routing water around the primary construction site at the dam and avoiding watercourses in other work areas.	Issue Addressed

DFO Fisheries and Oceans Canada
EC Environment Canada
Agency Canadian Environmental Assessment Agency
ONA Okanagan Nation Alliance
SFC Secwepemc Fisheries Commission
CCRIFC Canadian Columbia River Inter-Tribal Fisheries Commission
MoF Ministry of Forests

WLAP Ministry of Water, Land & Air Protection
AP&A Archaeology Planning & Assessment
LWBC Land and Water British Columbia Inc.
BCH BC Hydro
TIWG Technical Issues Working Group
EA Environmental Assessment
EMP Environmental Management Plan

AIA Archaeological Impact Assessment

Comment/ Issue	BC Hydro Response	EA Status
Fish and Fish Habitat		
Fish habitat restoration prescriptions for all tributaries to Coursier Lake should be developed and implemented by personnel with a demonstrated knowledge and working history directly related to stream channel/fish habitat restoration. (WLAP)	In discussions with environmental agency professionals and other practitioners experienced in stream/channel/fish habitat restoration, we have been advised that no active instream restoration of the tributary channels would be necessary at this time. BCH has been advised that an approach that allowed streamflows to dictate stream paths and habitat to establish in 2 to 3 years would be preferred. Monitoring will establish whether this approach is successful or whether intervention required.	Issue Addressed (Subject to BCH commitment to restore areas if monitoring identifies problems)
Smaller gravel and fines in lower Cranberry Creek have washed into the Arrow Lakes. This area should be reclaimed to support fish spawning cycles, possible by trucking in gravel and other materials. (K. Douglas)	Operation of the Walter Hardman Diversion Dam and Generation Station are outside the scope of the Coursier Decommissioning Project but will be addressed in the Walter Hardman Water Use Plan (WUP), which is expected to start this spring (2003). BCH will ensure that your concerns are forwarded to the WUP project team for consideration within the WUP and that your name is added to the list of stakeholders who will be contacted when the WUP process starts.	Response Satisfactory Issue Addressed
Allowing streams to establish a path for 2 to 3 years before doing any assessments is insufficient. Lack of a clearly defined stream path and access for fish during this period could be detrimental to the life history of the rainbow trout. (ONA)	If, in the opinion of a qualified professional, monitoring identifies any areas with long-term persistent problems that prevent the stream from reaching its natural equilibrium, BCH will implement remedial measures. BCH will provide monitoring reports to the ONA.	Response Satisfactory Issued Addressed
For stream paths with no riparian buffer, fall rye planting would be inadequate and inappropriate to expand to its intended use (soil erosion), compared to bank stabilization. (ONA)	In recent years when the reservoir was operated close to pre-dam lake levels, stream paths established quickly in patterns very similar to pre-dam conditions. Cottonwoods, willows and conifers will be planted in riparian areas in 2004. If, in the opinion of a qualified professional, monitoring identifies any areas with long-term persistent problems that prevent the stream from reaching its natural equilibrium, BCH will implement remedial measures. BCH will provide monitoring reports to the ONA.	Response Satisfactory Issued Addressed

DFO Fisheries and Oceans Canada
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Comment/ Issue	BC Hydro Response	EA Status
Fish and Fish Habitat		
BCH is knowingly allowing destruction of fish habitat by letting the streams find their pathway. A more aggressive stabilization approach is recommended. (ONA)	Based on past observations, streams will establish quickly in patterns very similar to pre-dam conditions. Erosion, silt and sedimentation will be monitored. If, in the opinion of a qualified professional, monitoring identifies any areas with long-term persistent problems that prevent the stream from reaching its natural equilibrium, BCH will implement remedial measures. BCH will provide monitoring reports to the ONA.	Response Satisfactory Issued Addressed
Water Quality		
Disposal of excavated dam material (spoilage) to within the proximity of First Creek may increase the input of sediments into the creek. (SFC/CCRIFC)	BCH attempted to rehabilitate the dam in mid-90's and constructed spoil retention dykes along the outside perimeter of the spoil area and provided additional riprap protection near First Creek. The dykes have performed as designed. BCH requires Area A for spoiling excavated earthfill dam materials and burying concrete from the low level outlet structure. Berms of the dyke will be raised if necessary to contain sediments.	Response Satisfactory Issue Addressed
Measures to mitigate detrimental TSS levels must be employed to ensure that spawning fish and/or their eggs are not adversely impacted in lower Cranberry Creek. (WLAP)	All work will be conducted in the dry including the removal of the lower levels of the dam, the LLO and valve house, the cofferdam, and the rebuilding of the stream channel through and below the dam. Turbidity levels will be monitored on a regular basis at Upper Cranberry Creek, below outlet channel in Cranberry Creek and downstream of the confluence with First Creek. TSS levels are elevated above regulatory guideline levels, additional water quality monitoring will be done at the Walter Hardman Headpond, at Highway 23 bridge crossing, and lower reach of Cranberry Creek above Arrow Lake.	Response Satisfactory Issue Addressed
ONA request to be kept informed of any changes or problems that arise in the future regarding spoil disposal and input of sediment into Westside Creek. (ONA)	BCH commits to keep the ONA informed of any changes or problems that arise in the future.	Response Satisfactory Issue Addressed
BCH should clarify the frequency for the monitoring of turbidity levels. Sampling should be done at least twice per day during decommissioning and more frequently if increased TSS levels are observed. (ONA)	Plans to eliminate the risk of silt and sediment entering the watercourse include working in the dry, containing silt and sediment disposal areas, dewatering and revegetation plans. If EMP objectives are not met BCH will increase the frequency and scope of the water quality sampling program.	Response Satisfactory Issue Addressed

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Comment/ Issue	BC Hydro Response	EA Status
Birds and Wildlife		
Recommend vegetation clearing and related disturbance activities proceed outside of the April 15 – July 31 breeding bird season. Depending on the extent of seasonal climatic variation, lengthening of the exclusionary period may be appropriate. (EC)	Section 4.3 of the draft EMP proposes that a survey for bird nests within the work area will be conducted by the Environmental Monitor immediately prior to starting construction work. Trees slated for removal will be removed as early in the construction period as possible, to avoid effects on established nests. Removal of veteran trees and snags will be avoided when possible.	Response Satisfactory Issue Addressed
Blasting activity should be undertaken outside of the April 15 – July 31 breeding bird season unless the frequency of this activity would be to an extent that any impacts arising from would be likely negligible. (EC)	Section 4.3 of the draft EMP proposes that blasting, sorting and hauling will start as soon as site access allows and will continue until mid summer and may deter birds from nesting in the vicinity of the quarry. It is expected that blast charges will be relatively small, underground and less likely to disturb birds in the vicinity.	Response Satisfactory Issue Addressed
Heritage and Culture		
BCH to commit to complete a post-decommissioning archaeological impact assessment (AIA) of the land area that will be re-exposed after the reservoir reverts to the pre-dam level of 1266m from the current level of 1274m. (AP&A)	BCH commits to complete a post-decommissioning archaeological impact assessment (AIA) of the land area that will be re-exposed upstream of Coursier Dam after the reservoir reverts to the pre-dam level of El 1266 from the current level of El 1274.	Response Satisfactory Issue Addressed
An archaeological reconnaissance was also conducted for the BCH application and when this study was done most level terrain was covered with snow. This study was preliminary and does not provide enough information to conclude that the decommissioning of the dam would pose little direct threat. The ONA insists that another reconnaissance be conducted when the area is not covered by snow and in addition to this study being done by helicopter that a ground walk also be conducted. (ONA)	BCH has committed to fund an Archaeological Impact Assessment (AIA) in 2003 as requested by MSRM. If Mr. Choquette is available to carry out the study and is acceptable to the Okanagan and Shuswap Nations, BCH has no objection to having him carry out this assignment. **EAO Note:** The choice of archaeologist is also subject to the approval of the AP&A.	Response Satisfactory Issue Addressed

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Comment/ Issue	BC Hydro Response	EA Status
Heritage and Culture		
BCH relied solely on information requested from the Provincial Heritage Registry for known heritage sites to conclude that there will be virtually no impact since the registry identified no known sites. However, most Okanagan heritage sites are not registered and the majority of Okanagan heritage sites consist of cultural landscapes. (ONA)	BCH is funding a traditional use study by the Okanagan Nations which is anticipated to be complete by the end of May 2003. BCH intends to conduct the AIA around the upstream perimeter of the former reservoir, upstream of the dam, between elevations 1274 and 1266 during summer 2003 after the reservoir has been lowered to El 1266. **EAO Note:** If traditional use information indicates aboriginal use of the other areas subject to disturbance by decommissioning or revegetation activities, the Archaeology Planning and Assessment Branch may require BC Hydro to expand the scope of the Archaeological Impact Assessment.	Issue Addressed
The Aboriginal Interest and Use Study (AIUS) that will take place should be through enough to include significant archival research. This study will determine the cultural significance of the site through interviews and site visits with Okanagan Elders and information must be included in project planning. (ONA)	**EAO Note**: For information. No response required.	No response required from BCH.
Ensure that all relevant information accumulated through the AIUS is used in a serious and appropriate manner. Specifically, if there is an indication of historical aboriginal use with in this study area that this information would trigger additional Archaeological Work in the area. (ONA)	**EAO Note**: AP&A has advised the EAO that if traditional use information indicates aboriginal use of an area that will be subject to impacts from the project, the AIA should be expanded in scope to include inspection of this area.	Issue Addressed
It is important that the same archaeologist who conducted the reconnaissance, Wayne Choquette, will also review the AIUS report for comment. (ONA)	BCH will complete an AIA in 2003 as requested by AP&A. If Mr. Choquette is available, BCH has no objection to him carry out this assignment. **EAO Note:** The choice of archaeologist is also subject to the approval of the AP&A.	Response Satisfactory Issue Addressed

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Comment/ Issue	BC Hydro Response	EA Status
Navigation		
What is the risk to pubic safety if boaters are present on the reservoir while the decommissioning works are in progress and how would this be addressed? (Agency)	The drawdown of Coursier reservoir to pre-dam conditions will be gradual and will not expose or create new obstacles which could pose a hazard to boaters (e.g. shore line elevation, bathymetry, rocks, stumps or debris).The lake outlet section and the restored stream channel downstream of the lake will be shallow and visible. BCH will post warning signs on the access road to Coursier Lake and in the vicinity of the decommissioned camp site located at the upstream end of the reservoir. BCH effectively implemented these public safety measures during the 1995/96 dam safety repairs for which Coursier Lake reservoir was drawn down to elevations below 1266 m.	Response Satisfactory Issue Addressed
Cumulative Effects		
While outside of the scope of this review, the operation of BCH's Walter Hardman generating facility may require flow management revisions (possibly minimum flow requirements in Cranberry Creek downstream of the Walter Hardman diversion) resulting from effects of the Coursier Dam Decommissioning Project in order to meet federal fisheries policies. DFO understands that these considerations will be forthcoming through a Water Use Planning process of that facility. (DFO)	**EAO Note:** For information. No response required	No response required from BCH.
The environmental effects of construction and operation of the Coursier Dam itself also should be scoped into BCH's Cumulative Environmental Effects assessment in Section 5.11. (DFO)	BCH provided Cumulative Effects Supplement to DFO - March 20, 2003.	Supplemental Information Satisfactory Issue Addressed

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Comment/ Issue	BC Hydro Response	EA Status
Cumulative Effects		
Because Lower Cranberry Creek is dry for several months with very low flows for several more, there is a need to consider minimum flows for this creek within the WUP for Walter Harman head pond to include fisheries values for all species and all life stages. (ONA)	**EAO Note:** For information. No response required.	No response required from BCH.
How does the revegetation plan support the enhancement of wildlife habitat? If the revegetation plan relies mostly upon "natural" regeneration then what species are expected to take resident and at what volumes of vegetation can be expected to sustain which species? (ONA)	**EAO Note:** On April 7th, the TIWG advised the EAO that, for the purposes of the current EA, the revegetation plan proposed by BCH is acceptable. The relative costs and benefits of planting conifers in Area B will be further examined, post-environmental assessment, through a process directed by the EAO in consultation with the TIWG and BCH.	For the purposes of this EA, the issue has been satisfactorily addressed.
What are the plans surrounding the endangered species in the region?	**EAO Note:** A response from BCH is not required as this question pertains to government planning on an issue beyond the scope of the current environmental assessment.	This issue is beyond the scope of the EA review.
The Federal Species at Risk Act, Bill C-5 calls for each provincial government to develop and implement similar legislation on crown lands within a specified period, or the federal act will apply. How will the expected implementation of the provincial endangered species legislation affect the current plans of this project? Has any consideration been given to mitigating the effects of new legislative requirements? (ONA)	**EAO Note:** A response from BCH is not required as this question pertains to government planning on an issue beyond the scope of the current environmental assessment.	This issue is beyond the scope of the EA review.

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Comment/ Issue	BC Hydro Response	EA Status
Revegetation Plans		
Overall objective should be to return denuded non-reservoir areas as close to original condition (pre-dam construction) as possible. Consider having a site assessment of denuded lands carried out by a 'reforestation specialist' (a British Columbia Registered Professional Forester) in effort to produce a re-vegetation plan that meets the overall objective. (MoF)	Revegetation plans have been developed by a BC Registered Professional Forester and are described in sections 4.5 and 5.5 of the Application and in revised Figure 22.	Response Satisfactory Issue Addressed
The RMA widths under the *Forest Practices Code* reflect best available knowledge for protection of fisheries resources and therefore should be applied to define the area of restoration adjacent to fish bearing streams. For example, this would increase the restoration width for South Cranberry Creek from the proposed 10 m on each side to 40 m on each side (20 m Riparian Reserve Zone plus a 20 m Riparian Management Zone). (WLAP)	The entire drawdown zone will be revegetated including both the RRZ and RMA. The reference to the 10m in the prescription outlines the extent of our increased effort to quickly establish critical riparian vegetation it should not be viewed as the limit of vegetation establishment adjacent to creeks. **EAO Note:** On April 7th, the TIWG advised the EAO that, for the purposes of the current EA, the revegetation plan proposed by BCH is acceptable. The relative costs and benefits of planting conifers in Area B will be further examined, post-environmental assessment, through a process directed by the EAO in consultation with the TIWG and BCH.	For purposes of EA, issue satisfactorily addressed.
Recommend that current and previous wetland habitats be retained and enhanced to reflect pre-dam conditions and not reforested. (EC)	Wetland habitats are being retained and will be left to recover naturally. Reforestation activities will only occur on the appropriate areas, as defined by the presence of stumps.	Response Satisfactory Issue Addressed
Do not reforest pre-dam wetland habitats but revegetate with indigenous shrub and herbacious species. (DFO)	Objective of revegetation plan is to return a conifer dominated habitat type through active reforestation and not turn previous wetlands into forests. The area that will be actively reforested (planted) will be defined by the presence of existing stumps. This should eliminate any concerns over habitat conversion which as pointed out would probably not be successful.	Response Satisfactory Issue Addressed
First Nations Traditional Use species must be included within the revegetation scheme. (SFC/CCRIFC)	Traditional use species identification and sourcing study will be commissioned in early March to identify appropriate species, sources and costs of material. BCH is prepared to consider the planting of traditional species subject to costs and availability of appropriate species.	Response Satisfactory Issue Addressed

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Comment/ Issue	BC Hydro Response	EA Status
Revegetation Plans		
"Area A" prescriptions state that an "erosion control mix" will be used. The seed mix must be ecologically suited to the site such that it does not hinder the development of indigenous vegetative communities. (WLAP)	Grass seed in general will only be used when erosion is considered to be a problem. Erosion will not be a problem if prompt development of indigenous vegetative communities occurs. If this development does not occur then grass seeding will be done as prescribed.	Response Satisfactory Issue Addressed
Prescriptions within the Riparian Reserve Zone of all fish bearing tributaries should include indigenous vegetation to filter sediments (i.e. "Area A" prescription) as well as conifers that will eventually provide critical large woody debris sources and bank stability functions (i.e. "Area D" prescription. At a minimum, prescriptions in the Riparian Management Zone should be aimed at controlling sediment generation (i.e. "Area A" prescription (WLAP)	At the technical issues working group meeting of March 6, 2003, BCH committed that the Area A prescription will apply to Westside Creek, South Cranberry Creek and the shoreline of Coursier Lake where stumps exist or suitable micro sites exist	Issue Addressed
Restoration of the wetland complex habitat (i.e. everything below the 1274 m contour) would result in conifers being planted within the Riparian Management Zone. (WLAP)	**EAO Note:** On April 7th, the TIWG advised the EAO that, for the purposes of the current EA, the revegetation plan proposed by BCH is acceptable. The relative costs and benefits of planting conifers in Area B will be further examined, post-environmental assessment, through a process directed by the EAO in consultation with the TIWG and BCH.	For purposes of EA, issue satisfactorily addressed.
Conifer planting should occur in suitable microsites along South Cranberry Creek to provide long-term LOD to the watershed. Plug stock should be large PSB 415(as indicated), and consideration of 2+ age class for subalpine fir (increased survival/competition hardiness). (SFC/CCRIFC)	Conifer planting will extend to appropriate microsites along Cranberry Creek, upstream of the dam to provide for long-term LOD. Large planting stock will be used and 2+0 stock will be grown.	Response Satisfactory Issue Addressed
Planting mix for the lake and tributary riparian areas could include occasional conifers to provide future sources of large organic debris in the lake and streams. (DFO)	Conifer planting extend to appropriate microsites along Cranberry Creek, upstream of the dam to provide for long-term LOD. Large planting stock will be used and 2+0 stock will be grown.	Response Satisfactory Issue Addressed
Plan should include willow staking riparian areas of West Creek as well as South Cranberry Creek. (DFO)	At the technical issues working group meeting of March 6, 2003, BCH committed that the Area A prescription will apply to Westside Creek, South Cranberry Creek and the shoreline of Coursier Lake where stumps exist or suitable micro sites exist.	Response Satisfactory Issue Addressed

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Comment/ Issue	BC Hydro Response	EA Status
Revegetation Plans		
Willow planting along Westside Creek must be incorporated. (SFC/CCRIFC)	Willow planting will be extended to include Westside Creek.	Response Satisfactory Issue Addressed
Suggest use of 412A willow plug rather than willow whips (increased survival rate anticipated). If whips are used, stock must be from local source of similar elevation and aspect. Whip installation must ensure that in excess of 75% of the whip length is buried. (SFC/CCRIFC)	Use of willow plugs versus willow whips is a design detail. BCH has had good success with the planting of willow whips along Arrow reservoir and it is not believed that using plug stock for this species is required.	Response Satisfactory Issue Addressed
Give consideration to mechanical treatment of reed canary grass in the subject area to provide opportunities for rare and sensitive species and increase biodiversity in the area. (EC)	BCH has committed to mechanically treating grass areas to facilitate the establishment of conifers.	Response Satisfactory Issue Addressed
For Westside Creek and South Cranberry Creek, a wider riparian vegetation buffer than 10m would be appropriate for these stream areas, and more conventionally a 15m minimum. (DFO)	At the TIWG meeting of March 6, 2003, BCH committed that the Area A prescription will apply to Westside Creek, South Cranberry Creek and the shoreline of Coursier Lake where stumps exist or suitable micro sites exist. 10 metre buffer will apply. (see also next response below)	Response Satisfactory Issue Addressed
Riparian restoration adjacent to the outlet restoration channel should reflect the RMA widths described in the FPC. (WLAP)	The entire drawdown zone will be revegetated including both the RRZ and RMA. The reference to the 10m in the prescription outlines the extent of our increased effort to quickly establish critical riparian vegetation it should not be viewed as the limit of vegetation establishment adjacent to creeks.	Response Satisfactory Issue Addressed
Riparian restoration prescriptions should be developed and implemented for all potential fish bearing (as defined by the *FPC)* tributaries to Coursier Lake (Westside Creek, smaller unnamed tributaries), not just South Cranberry Creek. (WLAP)	Area A prescription will be extended to Westside Creek. Specific prescriptions for all of the other small streams are not required. Vegetation that establishes naturally will provide for protection of these small streams.	Response Satisfactory Issue Addressed
Non- forested lands should have trees planted on elevated dry sites only (hummocks), possibly 200-400 stems/hectare of englemann spruce, subalpine fir and deciduous species. (MoF)	**EAO Note:** On April 7th, the TIWG advised the EAO that, for the purposes of the current EA, the revegetation plan proposed by BCH is acceptable. The relative costs and benefits of planting conifers in Area B will be further examined, post-environmental assessment, through a process directed by the EAO in consultation with the TIWG and BCH.	For purposes of EA, issue satisfactorily addressed.

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Revegetation Plans		
To achieve pre-dam conditions, the prescription should be modified to include planting coniferous trees in clumps as well as other wetland and shrub species below the 1274 m contour. (WLAP)	**EAO Note:** On April 7th, the TIWG advised the EAO that, for the purposes of the current EA, the revegetation plan proposed by BCH is acceptable. The relative costs and benefits of planting conifers in Area B will be further examined, post-environmental assessment, through a process directed by the EAO in consultation with the TIWG and BCH.	For purposes of EA, issue satisfactorily addressed.
Consideration for vole damage must be considered, particularly if fall rye planting occurs. (SFC/CCRIFC)	Vole activity not anticipated to result in significant mortality. No protection measures proposed but if subsequent vegetation surveys indicate that this is not the case, fill planting with protective measures will be considered.	Response Satisfactory Issue Addressed
Restoration prescriptions within 10 m of the high water mark of Coursier Lake (1266 m plus 1.0 m freshet surcharge = 1267 m) should include a combination of the "Area D" prescription as well as the "Area A" prescription. (WLAP)	At the technical issues working group meeting of March 6, 2003, BCH committed that the Area A prescription will apply to Westside Creek, South Cranberry Creek and the shoreline of Coursier Lake where stumps exist or suitable micro sites exist.	Response Satisfactory Issue Addressed
Riparian zone targeted for planting of conifers should be extended beyond 10 metres. It may be beneficial to increase the 10-meter slope distance riparian buffer on a site-specific basis to accommodate the natural occurrence of riparian vegetation. Conifer planting should be extended to a net of 25m on both sides of the stream and the perimeter of the lake as these trees would later provide valuable fisheries habitat and create bank stability and lessen the risk of erosion. (ONA)	**EAO Note:** This issue was discussed by the TIWG on March 26, 2003. A (minimum) ten metre riparian buffer in Area A is acceptable provided that, as part of the Environmental Management Plan, BCH monitor lateral bank stability; conduct fish habitat and spawning habitat assessments, provide monitoring reports to interested agency and First Nation representatives and implement remedial measures where long term problems are identified.	For purposes of EA, issue satisfactorily addressed.
What is BCH's definition of non-commercial/commercial timber and is this part of a working forest perspective? (ONA)	**EAO Note:** Response from BCH not required. MoF has advised the EAO that Area C and a small portion of area D would be the only sections of the Coursier project that would be deemed operable forest and return of area C to operable forest will have little impact on harvesting of adjacent areas.	For purposes of EA, issue satisfactorily addressed.
Concern that Coursier Lake basin not become "working forest" once it reverts to Crown land. As Coursier lake area would not have harvestable species available for some time, it could allow for 'off-setting' and permit the harvesting of additional areas within the ONA's Traditional Territory (ONA)	**EAO Note:** MoF notes that area C and a small portion of area D would be the only sections of the Coursier project that would be deemed operable forest. Area A and most of D would be within the Riparian Management Area of Coursier Lake and Cranberry Creek, and the balance of Area B would be classed as a forested wetland (not operable). Return of Area C to operable forest will have little impact on harvesting of adjacent areas.	Response Satisfactory Issue Addressed

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Comment/ Issue	BC Hydro Response	EA Status
Revegetation Plans		
Prefer non-commercial conifers planted in area "B", such as Alder, as these would also be more viable to the newly exposed sediment than Fir or Spruce. (ONA)	**EAO Note:** MoF notes that area C and a small portion of area D would be the only sections of the Coursier project that would be deemed operable forest. Area A and most of D would be within the Riparian Management Area of Coursier Lake and Cranberry Creek, and the balance of Area B would be classed as a forested wetland (not operable). Return of Area C to operable forest will have little impact on harvesting of adjacent areas.	Issue Addressed
With artificial methods of regeneration it may be necessary to monitor the site over a number of growing seasons to ensure that native species are regenerating and out competing the commercial seed mix species (if the fall rye and/or other selected species do not die off and fail to regenerate the following spring). (ONA)	Fall rye is a bi-annual and it is anticipated that it will die and allow colonization of natural species. BCH monitoring of vegetation will indicate density and diversity of species both naturally and artificially established.	Issue Addressed
Wetland habitats need to be monitored so that the vegetation recovers and that the water levels will be sufficient for the wetland to be maintained. This monitoring would be best incorporated into the revegetation plan. (ONA)	**EAO Note**: BCH has committed to monitor and report on the revegetation program and provide results to the ONA.	Issue Addressed
Would like to see the area be used to repatriate traditional species of cultural, medicinal and spiritual importance to First Nations. AIUS currently being conducted should serve to help identify such species for inclusion in the revegetation work. If traditional species are identified in the AIUS as critical, these species should be used in the revegetation workplans. (ONA)	BCH will consider the planting of traditional species subject to costs and availability of appropriate species and is undertaking efforts to identify and locate these plants. BCH prepared to discuss future support for an ONA proposal to secure funding to allow the ONA to actively repatriate traditional use species in the project area.	Issue Addressed
The 'erosion control mix' should be made up of indigenous species as much as possible. (ONA)	Cost, lack of sufficient availability of indigenous species and low probability that artificial seeding will be required all factor in the decision to use agronomic erosion control seed mix if natural colonization is not dense or rapid enough to prevent surface erosion.	Issue Addressed
EMP states that the coarse material will not be planted in spoil, quarry and other disturbed areas (Section 7.4.4). Will the coarse material be left unvegetated after the dam is decommissioned? This may not be favourable for wildlife habitat. (ONA)	These sites are a small part of total project area. BCH believes that revegetation of rock areas and coarse granular material would not be successful. The EMP provides BCH's prescription for planting on other disturbed areas. (**EAO Note**: *Land Act* permit requirements apply.)	Issue Addressed

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Follow-Up Monitoring		
Follow-up monitoring plan should include surveys and an alteration/maintenance program for a limited period to ensure that the constructed channel is operating as intended and that riparian revegetation is successful. (DFO)	Section 8.1.3 of the draft EMP proposes that the restored outlet channel will be evaluated following spring freshet in years 1, 2, 3 and 5 following project completion. Channel performance and integrity, the identification of barriers or obstructions, fish habitat and fish use will be evaluated. BCH will commit to channel maintenance if monitoring shows this is required.	Response Satisfactory Issue Addressed
Follow-up monitoring program to include surveys of winter DO levels in light of reports of concern that winterkills could occur at the original lake levels. This information may be useful in future management plans for the lake. (DFO)	Section 8.1.2 of the draft EMP proposes that factors influencing winterkill conditions may not manifest in the winters immediately following dam decommissioning. As such, winter dissolved oxygen sampling to assess winterkill will be done in the first 3 years following dam decommissioning and in years 5 and 7 after that.	Response Satisfactory Issue Addressed
Details on the Post Project Monitoring need to be clarified. (SFC/CCRIFC)	Section 8.2 of the draft EMP proposes that for all revegetated areas, vegetation surveys in years 1, 3 and 5 will to monitor ingress and growth of plants and performance of planted seedlings and identify areas not regenerating adequately. Performance of the vegetation prescriptions will be assessed in year 3. Seedlings will be replanted if survival drops below 500 stems/ha; willows will be replanted if their survival falls below 70%.	Response Satisfactory Issue Addressed
A maintenance plan must consider pest damage and vegetation re-introduction if a planting failure occurs (what survival rate is anticipated on all stocks?). (SFC/CCRIFC)	The EMP will clarify vegetation post monitoring and will set measurable targets and objectives for the revegetation program.	Response Satisfactory Issue Addressed
Expect EMP to be compendium of tabbed sub-plans (Sediment Control /Water Quality Plan; Site Preparation and Clearing Plan; Water Management Plan; Fish and Fish Habitat Mitigation and Compensation Plan; Site Rehabilitation/Revegetation Plan; Spill and Accidents Contingency Plan; Vehicle/Equipment Servicing Plan; Environmental Supervision and Monitoring Plan; Follow-Up and Monitoring Plan etc.) readily referenced by supervisors, construction workers and environmental monitors (DFO)	These comments have been incorporated into the draft EMP.	Response Satisfactory Issue Addressed

DFO	Fisheries and Oceans Canada	WLAP	Ministry of Water, Land & Air Protection	AIA	Archaeological Impact Assessment
EC	Environment Canada	AP&A	Archaeology Planning & Assessment		
Agency	Canadian Environmental Assessment Agency	LWBC	Land and Water British Columbia Inc.		
ONA	Okanagan Nation Alliance	BCH	BC Hydro		
SFC	Secwepemc Fisheries Commission	TIWG	Technical Issues Working Group		
CCRIFC	Canadian Columbia River Inter-Tribal Fisheries Commission	EA	Environmental Assessment		
MoF	Ministry of Forests	EMP	Environmental Management Plan		

Comment/ Issue	BC Hydro Response	EA Status
Follow-Up Monitoring		
Dissolved Oxygen should also be taken in the summer along with all relevant temperatures. (ONA)	BCH agrees that dissolved oxygen measurements should also be taken in the summer along with relevant temperatures.	Issue Addressed
For the revegetation monitoring they outlined that baseline parameters are described in the EMP of 'why to stop monitoring' (e.g. when the successional stage is at this point and conifers are at this height (no voles effects). i.e. biological parameters. What are the specific free grow standards for each species? (ONA)	BCH considers a 10 year monitoring program a reasonable amount of time to assess the success of the vegetation strategy. Results of monitoring will be made available to the ONA on an ongoing basis.	Issue Addressed
The decommissioned area could be maintained exclusively for wildlife habitat and traditional use values as much of the surrounding forested area surrounding the lake has been harvested and recently planted. (ONA)	**EAO Note:** Future land use of the area is guided by provincial land use plans and is beyond BCH's control. MoF notes that the return of Area C to operable forest will have little impact on harvesting of adjacent areas as the portion of operable forest is relatively small.	This issue is beyond the scope of the EA review.
High impact land-use including ATVs, hiking and camping may hinder natural regeneration within the project area. Access management initiatives may be warranted to ensure that the regeneration area is not impacted. Kiosks and/or signage could be implemented to educate recreational users. (ONA)	**EAO Note:** MoF has advised the EAO that ATV's will have access to the area. Signage may help inform the public of the revegetation efforts and may reduce potential damage. If post project monitoring identifies any concerns, road closure can be considered and/or implemented at that time under Section 105 of the Forest Practices Code of BC Act).	Issue Addressed

DFO Fisheries and Oceans Canada
EC Environment Canada
Agency Canadian Environmental Assessment Agency
ONA Okanagan Nation Alliance
SFC Secwepemc Fisheries Commission
CCRIFC Canadian Columbia River Inter-Tribal Fisheries Commission
MoF Ministry of Forests

WLAP Ministry of Water, Land & Air Protection
AP&A Archaeology Planning & Assessment
LWBC Land and Water British Columbia Inc.
BCH BC Hydro
TIWG Technical Issues Working Group
EA Environmental Assessment
EMP Environmental Management Plan

AIA Archaeological Impact Assessment

Comment/ Issue	BC Hydro Response	EA Status
Environmental Management Planning		
Constructed habitat features should meet/exceed amount of habitat of pre-dam conditions by a compensation ratio dependent on the degree of risk of failure and lag time involved. (DFO)	Section 7.4 of the EMP proposes that the revegetation strategy will use a combination of natural and artificial methods of regeneration that will result in the establishment of vegetation communities similar to those existing prior to inundation. To accelerate natural succession adjacent to the inlet stream, the lake and the outlet channel, a willow planting program will be conducted in the spring following dam decommissioning (2004). Habitat balance sheet is included as Appendix 4 of the EMP.	Response Satisfactory Issue Addressed
Sediment Control / Water Quality Plan should include protection measures at all disturbed sites including spoil disposal sites and quarry sites and mitigation measures identified in sec. 4.3.2 should be incorporated. (DFO)	Section 5.3 of the draft EMP proposes sediment control measures.	Response Satisfactory Issue Addressed
EMP should discuss any change to the project that may be caused by the environment (i.e. flooding). (Agency)	The draft EMP discusses management of reservoir levels during excavation of the notch and construction of the restoration channel.	Issue Addressed
BCH has indicated that the plans for the breach in the dam embankment are in the design stage at present. Final design will be completed and submitted to the Dam Safety Officer for review and approval. Also included with the final design will be an Emergency Response Plan (ERP) for the construction period. This ERP will document the procedures to be followed in the unlikely event of the occurrence of an extreme storm during the construction. (LWBC)	**EAO Note:** LWBC requirement will be a condition of certification if government approval granted for the project. Potential for impacts from flooding were considered during the EA as part of the assessment of potential impacts from accidents and malfunctions.	Issue Addressed
EMP to discuss malfunctions and/or accidents due to failures of project decommissioning activities and their potential environmental effects. (Agency)	**EAO Note**: Sections 5 & 6 and Appendices 1 & 2 of the draft EMP discuss environmental management procedures in response to accidents and malfunctions (e.g. spills, reservoir levels)	Response Satisfactory Issue Addressed

DFO	Fisheries and Oceans Canada
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ONA	Okanagan Nation Alliance
SFC	Secwepemc Fisheries Commission
CCRIFC	Canadian Columbia River Inter-Tribal Fisheries Commission
MoF	Ministry of Forests
WLAP	Ministry of Water, Land & Air Protection
AP&A	Archaeology Planning & Assessment
LWBC	Land and Water British Columbia Inc.
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EA	Environmental Assessment
EMP	Environmental Management Plan
AIA	Archaeological Impact Assessment

Comment/ Issue	BC Hydro Response	EA Status
Environmental Management Planning		
Diversity of planting should occur to reflect the diversity found in ICH areas. The three conifer species and willow don't seem enough diversity in the revegetation plan. (ONA)	BCH agrees that the ICH has a tremendous diversity of plants that is difficult to mimic in artificial regeneration. Fortunately, natural regeneration of many species in addition to those that are planted will increase the diversity of plant species in the affected area. BCH prepared to discuss future support for an ONA proposal to secure funding to allow the ONA to actively repatriate traditional use species in the project area.	Issue Addressed
The plan should be better formatted for easy access to relevant information at a given time. The Environmental Management plan needs to include more overall operation detail and specific methodology details as different tests and methods have different standards and errors. Knowing each test employed and how you conduct them will allow ONA and others to properly analyze the results and quality. (ONA)	EMP will be available to the ONA for review prior to being finalized. BCH will provide results of monitoring to the ONA on an ongoing basis.	Issue Addressed
Temporary haul roads, work areas, spoil sites, borrow areas, rock quarries, stockpiles and gravel repositories could be inventoried for noxious/invasive weed species on and off the project site. All equipment (earth movers, excavators, haul trucks, loaders and bull dozers) and personnel vehicles could be briefly inspected and/or cleaned before entering the project site. (ONA)	BCH and its contractors will inspect/clean all equipment and personal vehicles before entering the project area. BCH believes that the vegetation monitoring program as currently prescribed will identify any weed infestations on the project site and will recommend any management/control options.	Issue Addressed
Once dam decommissioning has been completed, noxious/invasive weed infestation monitoring could be integrated into revegetation monitoring as described in the EMP. If noxious/invasive weed infestations do occur following dam decommissioning, management/control options can be identified and implemented as required through a WMP. (ONA)	BCH and its contractors will inspect/clean all equipment and personal vehicles before entering project area. BCH believes vegetation monitoring program as currently prescribed will identify any weed infestations on the project site and will recommend any management/control options. (**EAO Note:** *Weed Control Act* applies regarding control of noxious weeds)	Issue Addressed

DFO	Fisheries and Oceans Canada
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Agency	Canadian Environmental Assessment Agency
ONA	Okanagan Nation Alliance
SFC	Secwepemc Fisheries Commission
CCRIFC	Canadian Columbia River Inter-Tribal Fisheries Commission
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Comment/ Issue	**BC Hydro Response**	**EA Status**
Socio-Economic		
The ONA has sought a commitment for some direct award contracts for employment for qualified nation members and BCH appears willing to accommodate this request on necessary restoration and study work. Pursuing economic opportunities for Nation members remains of critical importance. (ONA)	BCH will provide identified contractors from the Nations, along with local contractors from the region, with opportunities to bid on any work that will be forthcoming from this project and provide the Okanagan Nation with as much advance information as possible on tenders to be issued so contractors can prepare their bidding strategies. BCH intends to "direct" a good portion of the construction work at Coursier Dam using local construction equipment. Equipment will be obtained through contractors on a rental agreement basis, which includes a process for competitive price bids.	For purposes of EA, issue satisfactorily addressed.
Additional study may be needed into human usage levels in the area to measure if the decommissioning and restoration will actually increase access and human recreational use in harmful ways to a fledgling environment. (ONA)	**EAO Note:** The use of Crown Land after decommissioning is an issue outside of BCH's responsibility. EAO will provide ONA with a provincial contact if the ONA require clarification.	For purposes of EA, issue satisfactorily addressed.
Other		
The Okanagan Nation Alliance (ONA) and its member Bands are concerned over limited capacity funding being allocated by BCH for ONA participation in the EA process. (ONA)	**EAO Note:** An agreement on the purpose and level of capacity funding for ONA participation in the EA process has been reached.	Issue Addressed
BCH must recognize that the opportunity exists to devise a cooperative fish and wildlife habitat management, and vegetation management and monitoring processes with the Okanagan Nation	**EAO Note:** For information, no response required from BCH	No response required from BCH.
The discussion of significance is presented in text format in Section 5 and is summarized in Table 18. Therefore, a summary paragraph is optional. (Agency)	A discussion of significance is presented in the text of Section 5 and is summarized in Table 18.	Issue Addressed

DFO	Fisheries and Oceans Canada
EC	Environment Canada
Agency	Canadian Environmental Assessment Agency
ONA	Okanagan Nation Alliance
SFC	Secwepemc Fisheries Commission
CCRIFC	Canadian Columbia River Inter-Tribal Fisheries Commission
MoF	Ministry of Forests
WLAP	Ministry of Water, Land & Air Protection
AP&A	Archaeology Planning & Assessment
LWBC	Land and Water British Columbia Inc.
BCH	BC Hydro
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EA	Environmental Assessment
EMP	Environmental Management Plan
AIA	Archaeological Impact Assessment

Comment/ Issue	BC Hydro Response	EA Status
Other		
The discussion of issues raised by the public and measures proposed by BCH to address these issues is presented in text format in Section 7 and supplemented by information in Appendix E. A summary table of public comments would be helpful but is optional. (Agency)	BCH feels that the number of issues raised by the public and the measures proposed by BCH to address the issues do not lend themselves to being presented effectively in a summary table.	Response Satisfactory Issue Addressed
For information purposes, the applicable in-stream work window for streams that contain both in spring and fall spawning species is from July 15th to August 31st within any given year. BCH must obtain a Fish Collection Permit prior to removing fish from their habitat. (WLAP)	All work will be conducted in the dry and fish will be isolated from the work area. Thus, instream work windows should not apply. BCH will obtain Fish collection permits for fish salvages where required.	Response Satisfactory Issue Addressed
Ministry of Energy and Mines recommends BCH apply for the required Certificate of Public Convenience and Necessity (CPCN) from the British Columbia Utilities Commission (BCUC) in a timely manner. (Ministry of Energy and Mines)	EAO Note: BCH has advised the EAO that it is preparing its application for a CPCN.	Response Satisfactory
Blasting near the watercourse must be compliant with DFO's blasting guidelines. (DFO)	EAO Note: Provided for information purposes and will be addressed at permitting/authorization	Response Satisfactory Issue will be addressed at permitting
Develop habitat balance sheet to ensure that No Net Loss of the productive capacity of fish habitat (DFO)	Appendix 4 of the draft EMP presents a proposed habitat balance sheet.	Response Satisfactory Issue Addressed
Develop habitat balance sheet to ensure that No Net Loss of the productive capacity of fish habitat (DFO)	Appendix 4 of the draft EMP presents a proposed habitat balance sheet.	Response Satisfactory Issue Addressed

DFO Fisheries and Oceans Canada
EC Environment Canada
Agency Canadian Environmental Assessment Agency
ONA Okanagan Nation Alliance
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MoF Ministry of Forests

WLAP Ministry of Water, Land & Air Protection
AP&A Archaeology Planning & Assessment
LWBC Land and Water British Columbia Inc.
BCH BC Hydro
TIWG Technical Issues Working Group
EA Environmental Assessment
EMP Environmental Management Plan

AIA Archaeological Impact Assessment

APPENDIX 3

BC HYDRO COMMITMENTS AND ASSURANCES

APPENDIX 3 – BC Hydro Commitments and Assurances

	Environmental Management Plan (EMP)	Delivery Responsibility	Approximate Timing
1.	BC Hydro will provide copies of the final draft of the EMP to the SFC, the ONA and interested government agencies who may then direct any additional comments to DFO and the Comptroller of Water Rights for consideration as part of the permit authorization process.	BCH	Pre-Construction
2.	All contractors and on-site personnel will be required to comply with the EMP.	BCH	Pre-Construction
3.	BCH will retain an Environmental Monitor who will be responsible for ensuring that the environmental requirements of the EMP are adhered to, and will report to agencies as required by the EMP.	BCH	Pre-Construction
4.	The Environmental Monitor will survey for bird nests within the work area immediately prior to starting construction work and report results to CWS. Trees slated for removal will be removed as early in the construction period as possible, to avoid effects on established nests.	BCH	Pre-Construction
5.	Issues with regard to blasting and work around nesting birds will be addressed.	BCH	Pre-Construction
6.	All instream work will be conducted in the dry, and fish will be salvaged and isolated from the work areas.	BCH	Construction
7.	BC Hydro will complete a Fish and Fish Habitat Mitigation and Compensation Plan as part of its Environmental Management Program and to implement the plan to achieve No Net Loss of the productive capacity of fish habitat for the South Cranberry Creek/Coursier Lake system relative to pre-dam conditions.	BCH	Pre-Construction
8.	If excavated dam material (spoilage) is deposited in Spoil Area A, the berm of the existing dyke of Spoil Area A will be raised as necessary to mitigate risk of sediment releases into First Creek.	BCH	Construction
9.	Channel rewatering will be done slowly to minimize the sedimentation potential.	BCH	Post-Construction

BCH – BC Hydro	DFO –Fisheries and Oceans	SFC – Secwepemc Fisheries Commission
CWS – Canadian Wildlife Service	SRM – Ministry of Sustainable Resource Management	ONA – Okanagan Nation Alliance
EAO – Environmental Assessment Office	LWBC – Land and Water BC Inc.	AES – Advanced Energy Systems 1 Ltd

APPENDIX 3 – BC Hydro Commitments and Assurances

	Dam Safety	Delivery Responsibility	Approximate Timing
10.	BC Hydro will develop a post-decommissioning works monitoring and reporting program; submit the program to the Comptroller of Water Rights ("CWR") for review and approval; implement the monitoring and reporting program to the satisfaction of the CWR; and where instructed by the CWR, remediate any future structural defects, insufficiencies or failures of the decommissioning works.	BCH/CWR	Construction & Post Construction
	Archaeology		
11.	BC Hydro will, following the drawdown of the reservoir and prior to the start of revegetation activities within the reservoir, complete an Archaeological Impact Assessment of the land area within the reservoir between elevations 1274 metres and 1266 metres to the satisfaction of the Archaeology Planning and Assessment Branch of the Ministry of Sustainable Resource Management and implement any further measures identified by the Archaeology Planning and Assessment Branch.	BCH/SRM	Summer/Fall 2003
12.	If traditional use information indicates aboriginal use of area, beyond the land area within the reservoir between elevations 1274 metres and 1266 metres, that will be disturbed BC Hydro will, where required, expand the scope of the Archaeological Impact Assessment.	BCH/SRM	Summer/Fall 2003
	Revegetation Plan		
13.	BCH will adjust the boundaries of the revegetation plan to accurately reflect the previous forest and wetland areas. Wetland habitats are being retained and will be left to recover naturally.	BCH	Prior to start of revegetation works in the reservoir
14.	Grass areas will be mechanically treated to facilitate the establishment of conifers in areas targeted for forestry.	BCH	During Revegetation Works

BCH – BC Hydro	DFO –Fisheries and Oceans	SFC – Secwepemc Fisheries Commission
CWS – Canadian Wildlife Service	SRM – Ministry of Sustainable Resource Management	ONA – Okanagan Nation Alliance
EAO – Environmental Assessment Office	LWBC – Land and Water BC Inc.	AES – Advanced Energy Systems 1 Ltd

	Revegetation Plan	Delivery Responsibility	Approximate Timing
15.	With regard to willow plantings, elevation, aspect and environmental considerations to harvesting willows will be considered when selecting a source and willow planting survival will be maximized by planting willow whips appropriately. Willow planting will include cottonwood and will be extended to include Westside Creek.	BCH	Prior to Start of Revegetation Works
16.	Vegetation surveys will be conducted to determine survival success, and fill planting will be considered if required.	BCH	Construction & Post-Construction
17.	BCH will extend conifer planting to microsites along Cranberry Creek upstream of Coursier Dam; large planting stock will be used and 2+0 stock will be grown.	BCH	Construction & Post-Construction
18.	The entire drawdown zone will be revegetated including both the RRZ and RMA.	BCH	Construction & Post-Construction
19.	Grass seed in general will only be used when erosion is considered to be a problem. Erosion will not be a problem if prompt development of indigenous vegetative communities occurs. If this development does not occur, then grass seeding will be done as prescribed.	BCH	Construction & Post-Construction
20.	Post-decommissioning vegetation monitoring will be conducted according to measurable targets and objectives for the revegetation program.	BCH	Post-Construction
21.	BC Hydro and its contractors will inspect and clean all equipment and vehicles before entry to the project area. The revegetation program will include monitoring for project site weed infestations and BC Hydro will recommend and implement management control options where necessary.	BCH	Construction & Revegetation Works

BCH – BC Hydro	DFO –Fisheries and Oceans	SFC – Secwepemc Fisheries Commission
CWS – Canadian Wildlife Service	SRM – Ministry of Sustainable Resource Management	ONA – Okanagan Nation Alliance
EAO – Environmental Assessment Office	LWBC – Land and Water BC Inc.	AES – Advanced Energy Systems 1 Ltd

APPENDIX 3 – BC Hydro Commitments and Assurances

	Cumulative Effects	Delivery Responsibility	Approximate Timing
22.	Should the AES hydroelectric project proposal proceed on Lower Cranberry Creek, BCH will be referred to in the review process as a permit holder in the vicinity of the project. BC Hydro will review the materials provided and discuss appropriate directions (e.g. environmental management planning) with the appropriate referring agencies.	BCH	Post Construction
	First Nations		
23.	BC Hydro will provide copies of the detailed design for the restoration channel to the SFC and the ONA who may then direct any additional comments to DFO and the Comptroller of Water Rights for consideration as part of the permit/authorization process.	BCH	Pre-Construction
24.	A traditional use reforestation species identification and sourcing study will be commissioned to identify appropriate species/sources and costs of material. BC Hydro will consider the planting of traditional species subject to costs and availability of appropriate species.	BCH	Pre-Construction & Construction
	Navigation		
25.	BCH will submit an application for exemption under Section 5 (2) of the NWPA at the permitting stage of the project.	BCH	Pre-Construction & Construction
26.	BCH will address risk to public safety for potential boaters on the reservoir by posting warning signs on the access road to Coursier Lake and in the vicinity of the decommissioned campsite located at the upstream end of the reservoir.	BCH	Pre-Construction & Construction

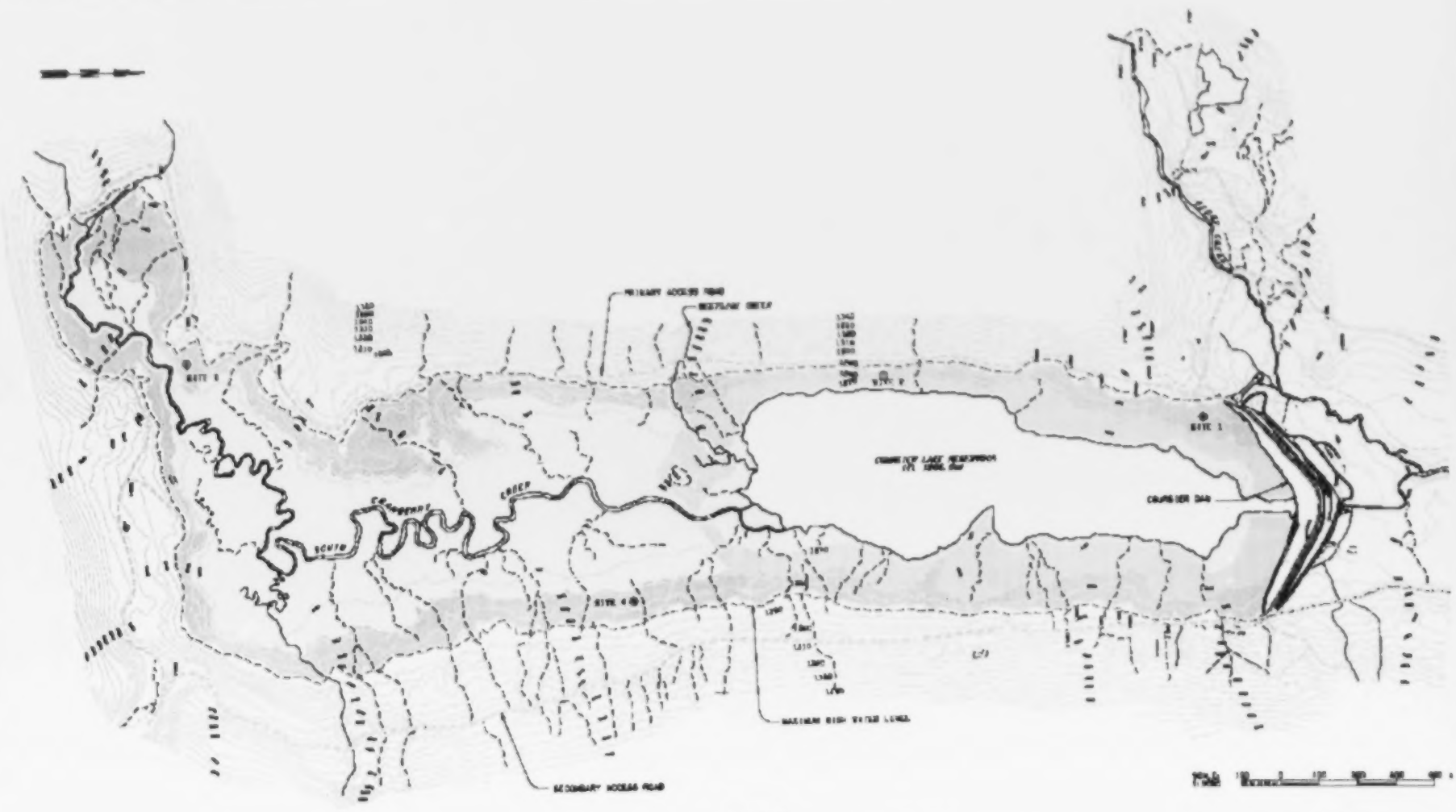
BCH – BC Hydro	DFO –Fisheries and Oceans	SFC – Secwepemc Fisheries Commission
CWS – Canadian Wildlife Service	SRM – Ministry of Sustainable Resource Management	ONA – Okanagan Nation Alliance
EAO – Environmental Assessment Office	LWBC – Land and Water BC Inc.	AES – Advanced Energy Systems 1 Ltd

	Monitoring	Delivery Responsibility	Approximate Timing
27.	BC Hydro will monitor and report on the revegetation program, restoration channel and other works for up to ten years upon completion of the dam decommissioning. [**EAO Note**: Timeframes for ongoing project monitoring by BC Hydro may be adjusted where the appropriate federal or provincial permitting authority considers necessary.]	BCH	Post-Construction
28.	A monitoring program will be conducted for determining whether natural stream flows have succeeded in re-establishing habitat and determining the stability of tributary stream channels.	BCH	Post Construction
29.	BC Hydro will monitor lateral bank stability; conduct fish habitat and spawning habitat assessments, provide monitoring reports to interested agency and First Nation representatives and implement remedial measures where long term problems are identified.	BCH	Post-Construction
30.	BC Hydro will submit written reports on the status of the Project and compliance with the Conditions of the Environmental Assessment Certificate to EAO: • two weeks prior to the start of excavation of the notch in the dam; • one month after completion of the restoration channel; • one month prior to the start of revegetation activities in 2004; and • annually, for five years beginning in 2004 or until relieved of the obligation by the EAO.	BCH	Pre Construction & Construction & Post Construction

APPENDIX 4

BC HYDRO REVEGETATION PRESCRIPTION

(REVISED FIGURE 22)



BC Hydro

CRUISER DAM DECOMMISSIONING PROJECT

REVEGETATION PRESCRIPTION

DATE 2002	FIG. 22
DWN BA.	Dwg. No. 221-C14-B4